

# **Flagstaff Watershed Protection Project**

## **Recreation Specialist Report**

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for:

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Coconino National Forest



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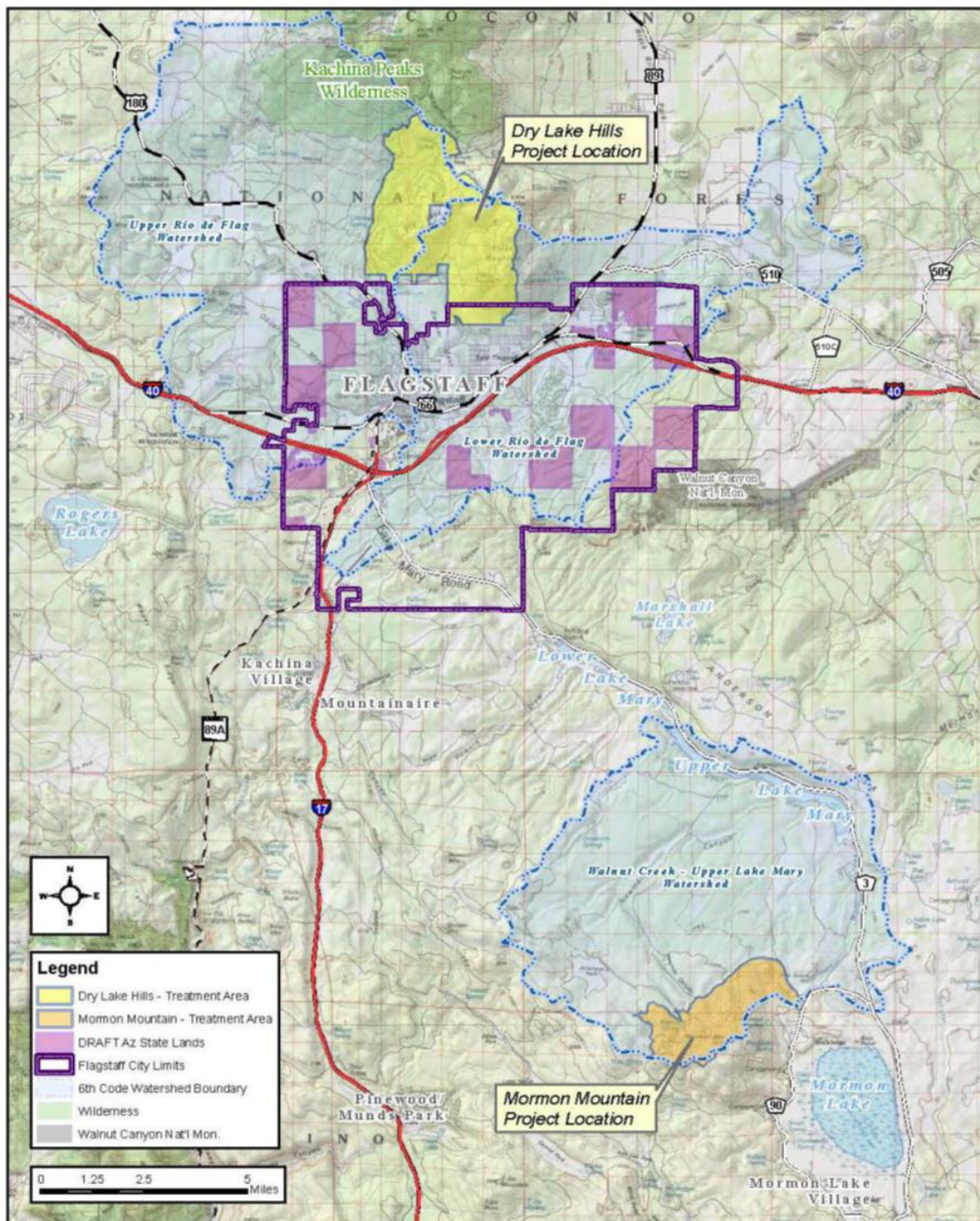
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## Introduction

The Flagstaff Watershed Protection Project (FWPP) includes three different action alternatives as well as the No Action Alternative. The action alternatives include mechanical thinning and prescribed burning to reduce the threat of high severity wildfire and subsequent flooding. The FWPP area includes two key areas near the City of Flagstaff, Arizona: the Dry Lake Hills portion of the Rio de Flag Watershed north of Flagstaff, and the Mormon Mountain portion of the Upper Lake Mary Watershed south of Flagstaff (**Error! Reference source not found.**).



This report analyzes and documents the effects of the proposed vegetation thinning and prescribed fire treatments on the recreation and wilderness resources relevant to the Flagstaff Watershed Protection Project (FWWP). The project area includes approximately 7,500 acres in the Dry Lake Hills area (due north of Flagstaff) and almost 3,000 acres on Mormon Mountain (southeast of Flagstaff, approximately 20 miles).

The purpose of this report is to provide detailed information and analysis regarding recreation and wilderness resources in order to support the conclusions in an Environmental Impact Statement (EIS). This report provides a brief description of the project; discusses key assumptions and methodologies used in the analysis; identifies existing conditions and recreation features, monitoring, and research literature used in the analysis; describes desired conditions and site-specific resource conditions; identifies potential resource impacts and effects of the proposed action and alternatives; and recommends site specific mitigation measures to minimize or avoid negative effects. Attachments to the report include Forest Visitor Survey for the Mount Elden / Dry Lake Hills Area.

***Compliance with Forest Plan and Other Relevant Laws, Regulations Policies and Plans***

Current management direction for recreation resources on the Coconino National Forest can be found in the following documents on file at the Coconino National Forest's District offices:

1987 USDA Forest Service Coconino National Forest Land and Resource Management Plan (Forest Plan) and all subsequent amendments (USDA, 1987).

36 CFR Part 294 Special Areas

FSM 2300 – Recreation, Wilderness and Related Resource Management

Recreation Opportunity Spectrum (ROS) Users Guide

Table 1 summarizes the existing Forest Plan direction.

**Table 1: Summary of the existing Forest Plan management direction for Recreation and Wilderness (Forest Service, 1987)**

DESCRIPTION	Forest Plan Management Direction	page(s)
Goals	Manage the recreation resource to increase opportunities for a wide variety of developed and dispersed experiences (Recreation).	22, 25
	Maintain and variety of Forest trails that include foot, horse, bicycle, and motorized trails, and challenge and adventure opportunities, as well as opportunities for the handicapped (Recreation).	
	Manage off-road driving to provide opportunities while protecting resources and minimizing conflicts with other users (Recreation).	
	Provide a wilderness management program that achieves high quality wilderness values while providing for quality wilderness recreation experiences (Wilderness).	

	Provide an area for environmental educational opportunities for the public school system, youth organizations, and the general public by maintaining the ecosystem and developing interpretive facilities (Elden Environmental Study Area).	
Forest-wide	<p>Issue and administer dispersed recreation special-use authorizations to provide needed recreation opportunities, minimize user conflicts, and ensure public safety and resource protection (Recreation).</p> <p>Review the ROS inventory as part of the project planning and make necessary corrections/refinements following field checking. Use the ROS inventory to analyze impacts to ROS classes due to management activities such as timber sales, range projects, and firewood sales (Recreation).</p> <p>Dispersed recreation areas are managed at standard service level (Recreation).</p> <p>Manage areas for public safety, resource protection, compliance checks, and capacity monitoring (Recreation).</p> <p>Wildernesses are managed to maintain wilderness quality and to maintain use within capacity. Manage to provide a quality experience for people while protecting wilderness resources (Wilderness).</p>	51, 57, 105
MA 1 Wilderness	<p>Enforce provisions of 36 CFR, part 261 and Title 16 U.S.C. regarding prohibitions in wilderness.</p> <p>Use the Limits of Acceptable Change (LAC) concept for establishing objectives, standards, and monitoring levels for wildernesses, as outlined in FS 2320.</p>	106
MA 3 Ponderosa Pine and Mixed Conifer, less than 40 percent slopes	<p>Manage dispersed recreation at the Standard Service Level.</p> <p>Manage the Mt. Elden/Dry Lake Hills to maintain a semi-primitive non-motorized ROS class.</p>	119
MA 4 Ponderosa Pine and Mixed Conifer, greater than 40 percent slopes	<p>Recreation use is concentrated on trails passing through the area because of the steepness and the amount of debris on the ground. In addition, some steep slopes are scenic backdrops for sensitive recreation viewpoints.</p> <p>Recreation use is largely limited to hiking and hunting.</p> <p>Manage with emphasis on wildlife habitat and dispersed recreation.</p> <p>Manage the Dry Lake Hills – Mt. Elden area for dispersed recreation and wildlife habitat and a semi-primitive non-motorized ROS class.</p>	138, 139, 140

	Manage Mt. Elden/Dry Lake Hills for visual quality objective of Retention.	
MA 18 Elden Environmental Study Area	<p>Emphasize environmental education opportunities for the Flagstaff Public Schools and the general public by maintaining the ecosystem and developing interpretive facilities. Non-motorized dispersed recreation is encouraged.</p> <p>Plan and support uses and trail in conjunction with the curriculum needs of the Flagstaff Public Schools.</p>	197, 198
FLEA Amendment 17 Area-Wide Goals and Objectives for ROS	<p>There is a range of recreational setting opportunities for people to enjoy the area's many scenic and aesthetic qualities.</p> <p>The diversity and quality of recreation opportunities, settings, and experiences are within acceptable limits of change to ecosystem stability and condition.</p> <p>Evidence of human activities and developments such as roads, trails, and facilities, is visually subordinate to the natural-appearing landscape.</p>	206-62
FLEA Amendment 17 Area-Wide Goals and Objectives for Camping	Dispersed campsites are maintained to protect forest resources and maintain visitor experience.	206-63
FLEA Amendment 17 Area-Wide Goals and Objectives for Rock Climbing	<p>Rock climbing areas are managed and maintained for appropriate experience, natural settings, attributes, and conditions, considering ROS objectives, wildlife, heritage, and soil and water resources.</p> <p>Rock climbing areas are managed in partnership with local rock climbers, climbing organizations, and outdoor recreationists.</p>	206-66
FLEA Amendment 17 Area-Wide Goals and Objectives for Non-Motorized Trails	<p>There are opportunities for a variety of trail experiences and challenges that are consistent with protection of sensitive resources, meet the needs of a diverse public, emphasize the natural environment, and meet ROS objectives.</p> <p>There is a network of trails linked to other trail systems, such as City and County trail systems.</p> <p>Trailheads are located in popular areas and provide adequate parking, signs, restroom facilities, public education, and resource management.</p>	206-67, 206-68

### Purpose and Need for Action

The primary purpose of the Flagstaff Watershed Protection Project (FWPP) is to reduce the risk of high severity wildfire and subsequent flooding in two key watersheds around Flagstaff, Arizona: in the Dry Lake Hills portion of the Rio de Flag Watershed, and the Mormon Mountain portion of the Upper Lake Mary Watershed. The EIS will analyze a variety of harvesting and fuel

reduction methods, including the use of traditional ground-based equipment, hand thinning, and also methods atypical for the region, including cable and helicopter logging, in order to treat steep, inaccessible terrain.

The FWPP analysis area includes approximately 10,543 acres (roughly 7,569 acres in the Dry Lake Hills portion and 2,974 on Mormon Mountain) and includes portions of the Coconino National Forest that have either not been analyzed or not been treated previously due to prohibitive costs associated with very steep terrain, low value material, and other challenging issues such as potential impacts to wildlife and visual concerns.

There is a need to reduce the risk of fire and post-fire flooding that would likely damage the drinking water infrastructure south of town and which could also cause extensive damage to residential and commercial areas should a high-intensity wildfire occur in mountainous areas that make-up the Upper Lake Mary and Rio de Flag watersheds.

More specifically, there is a need to reduce the potential for crown fire and high intensity surface fire, and to reduce the likelihood of human-caused ignitions.

### *Overview of Issues Addressed*

The primary issues of concern to recreation and wilderness resources from the action alternatives is to minimize and mitigate impacts to recreation features (e.g. trails, parking areas, signs, etc.), recreation activities (e.g. hiking, mtn. biking, equestrian-use, climbing, special-use events, hunting, driving for pleasure, birding, dispersed camping, etc.), and wilderness values. The concern of “single-track trail protection” was identified during the project scoping process. Also, the issue of hunting access coordination with Arizona Game and Fish Department was identified from public scoping.

Measure: Design features will be incorporated into the project to safeguard USFS trails and other recreational features/activities in the project area.

Measure: Design features will be incorporated into the project to ensure hunting access coordination with Arizona Game and Fish Department.

## Affected Environment

### *Existing Condition*

#### General Recreation Trends

Over the last several decades the number of people participating in outdoor activities has been increasing. Between 2000 and 2007, the number of people participating in outdoor activities throughout the nation increased by 4.4 percent (Cordell 2008b). The trend of visitor use of nature-based public lands, however, is less clear. Inconsistent count methods across time, at different scales, and not accounting for a large increase in visitors entering from adjoining private or other public lands are among some of the reasons that different studies may illustrate differing results.

Though there is a clear pattern of growth in nature-based recreation and the use of public lands after World War II, things become less clear in the last three decades. There was a long-term growth trend in use of public lands between the 1960s and 1980s. Beginning in the 1990s, most data show this growth slowed or leveled out in the 1990s, with peak visitation to nature-based

public areas being estimated as occurring in 2000, and then decreasing through 2006 (Cordell et al. 2008c). Data from 2007 show that reported visits increased yet again up to levels observed in 2001 (Cordell et al. 2008c).

Where the science is the least clear is in the area of how *nature-based* recreation has changed in the last 10 years. Nature-based recreation is a subsector of non-motorized recreation, which includes viewing wildlife and birds, primitive camping, backpacking, and visiting wilderness and primitive areas (Cordell 2008b). The National Survey on Recreation and the Environment (NSRE) found that nature-based recreation activities have increased since 1994 (Cordell et al. 2008c). Other studies show that while total visitation for nature-based recreation may have been even or slightly increased overall over the last two decades, per capita nature-based recreation actually declined since 1987 (Pergams 2008). Thus, though nature-based recreation may have the same or an increased total number of people involved, the total percentage of people participating in nature based recreation may have decreased by as much as 25 percent between 1981 and 2007 (Pergams 2008). These two studies appear to have contradictory conclusions about trends in nature-based recreation in the last decade. It is important to realize, however, that the studies include different research methods (the NSRE is based on survey data and the Pergams study uses National Park Service visitation data) and both express their results differently (total number of persons versus per capita numbers).

**Table 2: Participation and change in participation in outdoor recreation activities, 200-2007 (Cordell 2008b)**

Activity	Total participants (millions), 2007	Percentage change in participants, 2000–2007
Viewing or photographing flowers and trees	118.4	25.8
Viewing or photographing natural scenery	145.5	14.1
Driving off-road	44.2	18.6
Viewing or photographing other wildlife	114.8	21.3
Viewing or photographing birds	81.1	19.3
Kayaking	12.5	63.1
Visiting water (other than ocean beach)	55.5	1.6
Backpacking	22.1	–0.6
Snowboarding	11.3	7.3
Rock climbing	8.7	–5.5
Visiting nature centers, etc.	127.4	5.0
Big-game hunting	20.2	12.8
Mountain climbing	11.8	–12.5
Visiting ocean beach	96.0	10.5
Sightseeing	113.2	4.1
Visiting wilderness	70.6	3.0

Overall, the data on recreation trends tell us that the total amount of outdoor recreation has increased through 2007, but that *nature-based* recreational activities may have actually decreased when looking at a per capita basis. This data illustrates two distinct, yet opposite trends that are occurring at the national scale. There is no comparable data source to determine whether or not these trends are occurring at the local scale of the Coconino National Forest or if they are not.

While the statistics may present seemingly contradictory conclusions, it is clear that public lands visitation is continuing to increase, but the activities people are choosing to participate in on public lands is changing from what was observed in past decades. In particular viewing, studying, and photographing nature, and in particular wildlife, have grown strongly since 1994 (Cordell et al. 2008c). Other activities such as walking, family gathering outdoors, gathering mushrooms and berries, kayaking, snowboarding, or visiting water also increased in the total number of people participating between 2000 and 2007 (Cordell et al. 2009). Driving off-road has also grown during the 2000-2007 period. According to various survey-based studies, the growth in off-road driving is only behind the growth in photographing nature and kayaking in magnitude. Total participation in other activities has clearly decreased, such as mountain climbing and rock climbing. Mountain biking, backpacking, visiting historic sites, and downhill skiing has decreased in the percentage of participants as well (Cordell et al. 2009).

### Recreation trends on the Coconino National Forest

Recreation use of the Coconino National Forest has grown rapidly over the last two decades, commensurate with the growth of the population in the southwest region. Data collected from 2005 shows that the Coconino National Forest hosts about 4.6 million visitors a year (USDA Forest Service 2009, p. 7). Almost half of these visits are to developed parts of the forest, such as campgrounds, Arizona Snowbowl ski area, or highly developed day use sites such as Bell Rock, Lake Mary or Grasshopper Point (USDA Forest Service 2009, p. 7).

Other forest visitors use less developed forest areas to pursue a wide variety of activities, including camping, backpacking, picnicking, viewing wildlife and natural features, viewing historic or archeological sites, nature study, relaxing, fishing, hunting, off-highway vehicle (OHV) use, driving for pleasure, snowmobile travel, motorized and non-motorized water travel, other motorized activities, hiking or walking, horseback riding, bicycling, downhill skiing and snowboarding, cross-country skiing and snow shoeing, gathering forest products, and motorized trail use. Of all of these activities, hiking/walking and viewing scenery were measured as the two dominant activities on the Coconino National Forest. More than 65 percent of the people who visit the forest report participating in recreational activities who are not dependent on motor vehicle use beyond access to the forest via main roads, including viewing scenery (85 percent), hiking (79 percent), viewing wildlife (71 percent), and relaxing (66 percent) (USDA Forest Service 2009, p. 16).

The Coconino National Forest is primarily visited for non-motorized activities such as hiking, backpacking, viewing wildlife, or viewing natural features. This is clearly illustrated in all reports and survey data collected on the Forest (USDA Forest Service 2009). In addition, the Coconino National Forest receives greater amounts of forest visitors participating in non-motorized recreation activities than all other national forests in northern Arizona, including the Kaibab, Apache-Sitgreaves, Tonto, and Prescott.

If one compares National Visitor Use Monitoring data from all northern and central Arizona national forests, it appears that the Coconino is not only one of the more popular forests, but serves a particular niche, which is that it is heavily used by non-local (greater than 50 miles from the Forest) visitors for non-motorized recreational purposes. The Coconino National Forest received approximately three times the use of the Apache-Sitgreaves and the Prescott national forests and 22 times the use of the Kaibab National Forest. Only the Tonto National Forest has similar numbers of visitors. Yet, the Tonto National Forest is much more heavily used for motorized recreation and much less heavily used for non-motorized recreation activities. This is likely due to the fact that the large majority of forest visitors on the Coconino National Forest are

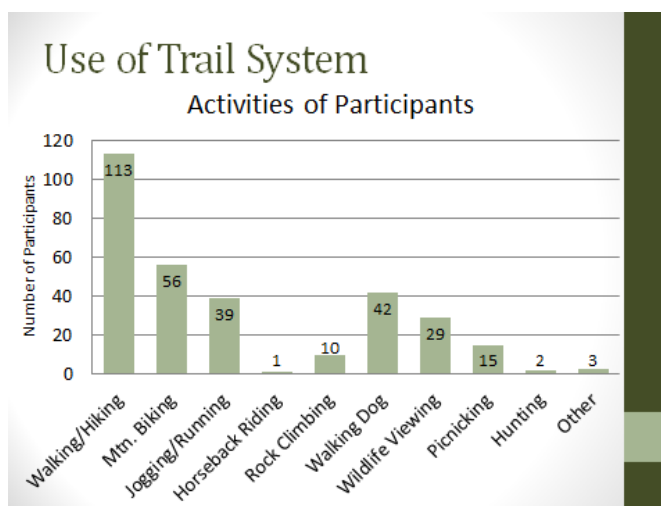
not from local communities, whereas the majority of visitors to the Tonto are from the nearby Phoenix metropolitan area, which are more likely to haul their trucks, ATVs, or other OHVs to the nearby National Forest.

The most common *primary* use by visitors on the Coconino National Forest is hiking and walking, which was reported by 38 percent of respondents (USDA Forest Service, 2009). It is likely for this reason that the large majority of developed trails on the forest are used by hikers, but there are also hundreds of miles of trails specifically designed and maintained for horseback riding, mountain biking, and cross-country skiing. Also, there are hundreds of miles of unauthorized trails, often referred as “user-created trails” adjacent to communities such as Flagstaff and Sedona that are not accounted for in Forest Service system trail inventories. These trails evolve over time by repeated use – whether it is from a hiker, mountain biker, motorcyclist or equestrian. There have been several instances where illegal trail building has occurred; where motorized and mechanized tools have been used to construct unauthorized trails.

In 2012 and 2013 students from Northern Arizona University, FS personnel, members of Friends of Northern Arizona, and other volunteers conducted an informal survey of forest visitors at different trailheads for the Mount Elden / Dry Lake Hills area (see appendix A). The purpose of the survey is to assist forest personnel with the Mount Elden / Dry Lake Hills Planning Project (see page 18).

In general, the survey was designed to better understand who currently uses the area, what type of recreational activities people enjoy in the area, and what forest visitors would like to see in the future.

For example, survey results identified that walking/hiking is the most common trail use activity by forest visitors (table 3) on the Mount Elden / Dry Lake Hills trail system.



**Table 3: Forest visitor survey results, Mount Elden / Dry Lake Hills Planning project.**

### Recreation Activities within the Project Area

There are a number of developed recreation facilities and USFS trails within and/or adjacent to the FWPP analysis area. Also, the Kachina Peaks Wilderness is located just north of Forest Road (FR) 522 (Freidlein Prairie Road) near the northern boundary of the project area. The Recreation Opportunity Spectrum (ROS) classification within the analysis area includes Semi-Primitive Non-Motorized (SPNM), Semi-Primitive Motorized (SPM) and Roded-Natural (RN).

The Mt. Elden/Dry Lake Hills region is one of the most popular and heavily used areas for recreational purposes on the Forest; largely because of its proximity to Flagstaff and the appealing forest topography and vegetation. The area is located adjacent to Flagstaff, Arizona, which has a population of 65,870 (U.S. Census Bureau, 2010). The trail system is highly valued

by the Flagstaff trail community including organizations such as Flagstaff Biking Organization, Coconino Horseman's Alliance, Northern Arizona Trail Runners Association, Arizona Trail Association, Flagstaff Unified School District and others. The area provides thousands of forest visitors an opportunity to enjoy the great outdoors whether they are hiking, mountain biking, riding their horse, hunting, birding, dispersed camping, driving for pleasure, snowshoeing, cross-country skiing or rock climbing. Adjacent property owners walk this area on a daily basis and the project area abuts Buffalo Park, a city-owned and managed park that also serves as a primary portal into the forest from Flagstaff.

The Mt. Elden /Dry Lake Hills Trail System was dedicated in 1987. Within and/or adjacent to the analysis area there are six trailheads providing access to twelve designated USFS trails including portions of the Arizona National Scenic Trail, Flagstaff Loop Trail, and the historic Beale Wagon Trail. Currently Flagstaff Climbing operates under a special-use permit to provide guided climbing opportunities at West Elden (adjacent to Elden Lookout road – FR 557). There is a launch pad at the top of Mt. Elden in the Turkey Park area that is used by hang gliders and para-gliders. Additionally, there are many organized recreation events that have been issued special-use permits for over a decade, such as the Soulstice Mountain Trail Run sponsored by Northern Arizona Trail Runners Association.



**Figure 1: Sunset Trail – Hiker enjoying the views and scenery.**

The Mt. Elden Environmental Study Area (ESA) was established in the mid-seventies. The ESA is a 400-acre parcel of land established as a study site and a bird sanctuary. As part of the ESA, there are four designated trails that provide interpretive opportunities for students and the general public. The western portion of the Mt. Elden ESA is located within the analysis area. The ESA is frequented by local school groups and is identified as a birding hotspot in many bird watching publications.



**Figure 2: Hunting Unit 11 M, AZGFD**

Game management (hunting) unit 11M (Region II) is located in the analysis area just north of Flagstaff. The Arizona Game and Fish Department manages for the following species within this unit - antelope, black bear, elk, mule deer, and Merriam's turkey.

The pronghorn hunt occurs in August thru September. The archery bear hunt in Unit 11M is combined with Unit 6B and occurs in the early fall. The elk hunt is September thru December, and the deer hunt is August thru January (AZGFD, website 2013).



**Figure 3: Map of Hunting Unit 6A, AZGFD**

Game management (hunting) unit 6A (Region II) is located in the analysis area near Mormon Mountain. The Arizona Game and Fish Department manages for the following species within this unit - black bear, elk, mule deer, Merriam's turkey, white-tailed deer, javelina, mountain lion, bighorn sheep, tree squirrel, and waterfowl. The Pine Grove Quiet Area, located in unit 6A, does not allow vehicle use for any reason, including game recovery. The boundary is from Upper Lake Mary south along Lake Mary road (FH3) to the Mormon Lake road (FR 90). Proceed west on the Mormon Lake road to FR 132.

On November 2, 2005, the Forest Service announced final travel management regulations governing OHVs and other motor vehicle use on national forests and grasslands. Under the new rules, forests

that do not restrict OHV travel to "designated roads-and-trails" must do so. The Coconino National Forest signed a Record of Decision on the Travel Management Project on September 28, 2011 (USDA, TMR Record of Decision – Coconino NF 2011). Implementation of these new rules went into effect on May 1, 2012.

Forest Orders that affect recreation activities within the analysis area are Campfire Restrictions (Order Number 04-13-09-F), Camping/Campfires Prohibited (Order Number 04-112-R), Road Restrictions on Roads Being Obliterated (Order Number 04-99-10-E), Dispersed Camping Stay Limits (Order Number 04-99-08-R), .

There is a proliferation of user-created or unauthorized trails within the analysis area. These trails have developed as a result of use by a variety of user groups - including hikers, runners, dog walkers, mountain bikers, equestrians, and motorcyclists. Also, it is common for many trail users (hikers, mtn. bikers, equestrians) to use old road beds or skid trails as well as old fire control lines used for prescribed fires. Additionally, there are several downhill mountain biking trails – especially on the north slope of Elden Mountain from Turkey Park north to Elden Lookout Road (FR 557), near Brookbank Trail. Additionally, there is a network of user-created trails within the urban interface (southern boundary of the analysis area). Many of these unauthorized trails, located adjacent to neighborhoods within the Mt. Elden Environmental Study Area, have created a web of social trails used for dog walking, exercise and mountain biking.

## Trails

The following USFS trails and/or segments of the trails are located within the analysis area.

**Table 4: USFS trails located within the FWPP analysis area**

Name	Length (miles)	User Type	Level of Use	Season of Use
Lower Oldham #1	5.5 mi.	Hiker, mtn. biker, equestrian	moderate	April - November
Brookbank #2	2.5 mi.	Hiker, mtn. biker, equestrian	moderate	April - November
Sunset Trail #23	4.0 mi.	Hiker, mtn. biker, equestrian	moderate	April - November
Pipeline #42	2.8 mi.	Hiker, mtn. biker, equestrian	heavy	April - November
Little Elden #67	4.7 mi.	Hiker, mtn. biker, equestrian	moderate	April - November
Upper Oldham	1.5 mi.	Hiker, mtn. biker, equestrian	low	April - November
Rocky Ridge #153	2.2 mi.	Hiker, mtn. biker, equestrian	moderate	April - November
*Arizona National Scenic Trail	9.8 mi.	Hiker, mtn. biker, equestrian	moderate to heavy	April - November
*Fort Valley Trail System – Includes Secret and Upper Moto Trails	6.7 mi.	Hiker, mtn. biker, equestrian, motorcyclists	moderate	April-November
*Mormon Mountain Trail #58	3.0 mi.	Hiker, mtn. biker, equestrian	moderate	April-November
*Dairy Springs Trail #136	0.5 mi.	Hiker (interpretive trail)	moderate	April-November
*Ledges Trail #138	1.0 mi.	Hiker, mtn. biker, equestrian	moderate	April-November

\*Segment or portion of the trail within or adjacent to the FWPP analysis area.

The Flagstaff Loop Trail is approximately 42 miles in length and encircles the city of Flagstaff. It is comprised of many existing trails on different land jurisdictions. USFS trails as part of the Flagstaff Loop Trail within the project area include Lower Oldham #1, Rocky Ridge #153, and Pipeline #42.

## Trailheads

The following trailheads are located within and/or adjacent to the analysis area.

**Table 5: USFS trailheads located within the analysis area**

Name	General Location	Comment
Schultz Creek / Rocky Ridge TH	Approximately ¼ mile north of FR 420 and FR 557 junction	Facility includes parking area, information kiosk, trail signs, and a hitching post for equestrians.
Sunset TH	Schultz Pass area (off FR 420)	Facility includes parking area, information kiosk,

		trail signs, and a hitching post for equestrians.
Schultz Tank TH	Schultz Pass area (off FR 420)	Adjacent to the analysis area. Facility includes parking area, information kiosk, trail signs, and a single-vault toilet.
Buffalo Park TH	Located off Cedar Avenue (near USGS buildings)	City of Flagstaff Park – adjacent to project analysis area.
Mormon Mountain TH	Adjacent to Dairy Springs Group Campground (0.6 mi. west of FR 90)	Facility includes parking area, information kiosk, and trail signs.
FR 240/90 TH	Located at the junction of FR 240 and FR 90	TH parking area with kiosk to inform visitors about TMR guidelines.

There are several impromptu parking areas within the analysis area including along FR 557 where Lower Oldham and Rocky Ridge Trails junction. Forest visitors created this ad hoc parking site by parking their vehicles just off the roadway to access West Elden climbing area and the nearby trails. Also, there is a popular parking area at the east end of FR 522, which provides access to Kachina Peaks Wilderness.

### Recreation Special-Use Events

The following recreation special-use events (e.g. running, biking, hiking, etc.) take place within and/or adjacent to the analysis area.

**Table 6: Special-use events that occur within the FWPP analysis area**

Name / Type of Event	# of Users	General Date(s)	Location (general route description)	Notes
MBAA / Mtn. Biking Event	300	mid-May	Fort Valley Trails to Dry Lake Hills	Stage at Fort Valley TH of off FR 164B.
Coconino County Parks & Rec Dept. / Hiking Tour	22 per trip at 7 trips (~144 total)	June - Oct.	Mt. Elden and Dry Lake Hills Trails: Brookbank, Rocky Ridge, Fatman's Loop	Issued a permit but not used due to limited interest; may pursue a future permit.
Shadows Foundation / 10-mile and 10K Running Event	100	late June	Elden Lookout road (FR 557) to Sunset trail to Heart trail to Sandy Seep trail to Sandy Seep TH	Staged on private land at the jct. of FR 557 and 420
Chiropractic Joint / Benefit Walk	75	mid-Sept.	Elden Lookout Trail	
NATRA /	225	mid-Oct.	Sunset TH to Brookbank trail	14 <sup>th</sup> year; stage at

Soulstice Mtn.Trail Run			to Little Gnarly trail to Schultz Creek trail to Sunset TH	Sunset TH
Aravaipa Running / 50-mile Running Event	75	late Sept.	Lower Oldham Trail to Rocky Ridge Trail to Upper Oldham Trail to Sunset Trail to Heart Trail to Little Elden Trail to Little Elden Springs Rd. to Schultz Pass Rd. to Schultz Creek Trail	1 <sup>st</sup> year in 2012; staged @ Buffalo Park

## Climbing

The West Elden climbing site is located within the project area – adjacent to Elden Lookout road at the jct. of Lower Oldham Trail. West Elden is one of Flagstaff’s oldest and most popular climbing areas. It is made up of an 80-foot tall Dacite cliff which hosts a large number of traditional routes.

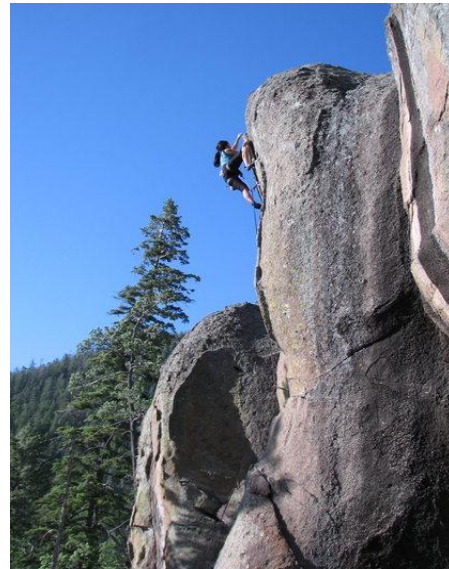
This climbing expanse houses excellent crack, slab and face climbs of all grades. West Elden is a good place to try climbing for the first time, work on intermediate to advanced trad skills or have a family or group outing.

Over the years it has gained popularity and is now found on many websites and in a number of climbing publications.

## Outfitter Guides / Youth Camp

Flagstaff Climbing, formerly called Vertical Relief, provides guided climbing opportunities at West Elden under a special-use permit.

Mormon Lake Lodge provides horse-back riding in the forest under a special-use permit. They offer 1-hour, 2-hour, and half-day rides. They use trails and roads south of the FWPP analysis area near Mormon Mountain. The stables are generally open May-September.



**Figure 4: West Elden Climbing Site – Climber at top of Bold is Love route, photo provided by Mtn. Project**



**Figure 5: St. Joseph's Youth Camp**

Saint Joseph’s Youth Camp is located at the junction of FR 90 and FR 240, and is about 1.5 miles southeast of the FWPP boundary. Saint Joseph’s Youth Camp is administered under an organizational permit with the Forest Service. The camp is sponsored, in part and operated by the Arizona Knights of Columbus. St. Joseph’s is a 501(C) (3) non-profit organization. It has been operating since 1948. The camp provides week-long activities for youth (ages 8 – 15) visiting from other parts of the state/country. Activities include arts and crafts, hiking,

archery, horseback riding, mountain biking, campfire and telescope nights, and others. Some of these activities, such as hiking and mountain biking, can occur within the project area. The week-long youth camps occur during the summer months, generally May through August. The site can also be rented for private use (clubs, religious retreats, family gatherings, etc.). The times available vary from month to month. The rental season is from May through October.

### Dispersed Camping

Dispersed camping has increased throughout the Flagstaff wildland urban interface in the past several years. In many areas, this has caused resource impacts such as soil compaction and erosion, loss of vegetation, increased fire risk, displacement of wildlife, and accumulation of trash and human waste.

To help prevent unacceptable resource damage, disturbance to wildlife and reduce fire risk from dispersed camping, the Forest Service has designated 14 campsites along FR 522 (Freidlein Prairie Road) for dispersed camping. Camping and campfires are allowed only at designated sites along FR 522. All designated campsites along FR 522 are located on the south side of the road, with the exception of campsite #1 and #3. Signs have been placed along the road when entering and leaving the designated camping area. The designated campsites are marked with a brown vertical fiberglass post with a site number and a "Designated Campsite" decal (figure 6). Each designated dispersed campsite has a place to park, fire ring, and a place for a tent – there are no fees. Approximately 1 mile of FR 522 is along the northern boundary of FWPP.



**Figure 6: Example of Designated Dispersed Campsite adjacent to FR 522**

The Coconino National Forest implemented new travel rules for motor vehicles on May 1, 2012, per the Travel Management Rule Record of Decision (signed September 2011). The project area contains approximately 26.5 miles of roads closed to motorized travel through the Travel Management Rule (TMR) decision. In most cases, cross-country travel in motor vehicles is now prohibited. The Motor Vehicle Use Map (MVUM) is the legal document that shows where it is legal to drive a motor vehicle. The current map was published May 1, 2013. The MVUM is to be re-published every year.

The dot notations on the MVUM indicate corridors where vehicles can be driven off-road up to 300 feet to accommodate "car camping." These areas are known as "camping corridors." On roads without the dot notations, you can park your vehicle up to one vehicle's length (approximately 30 feet) off the road and either camp there or park the vehicle and set up camp further away from the vehicle if desired.

Within the Dry Lake Hills portion of the FWPP analysis area, there is a 1-mile camping corridor located on FR 420 (Schultz Pass Road) -approximately 1.5 miles north of the junction with FR 557 (Elden Lookout Road). Near Mormon Mountain, there is roughly a 4-mile camping corridor located on FR 132 - from the junction of FR 90 to the junction of FR 132D (USDA, MVUM – Coconino NF, 2013).

## Wilderness

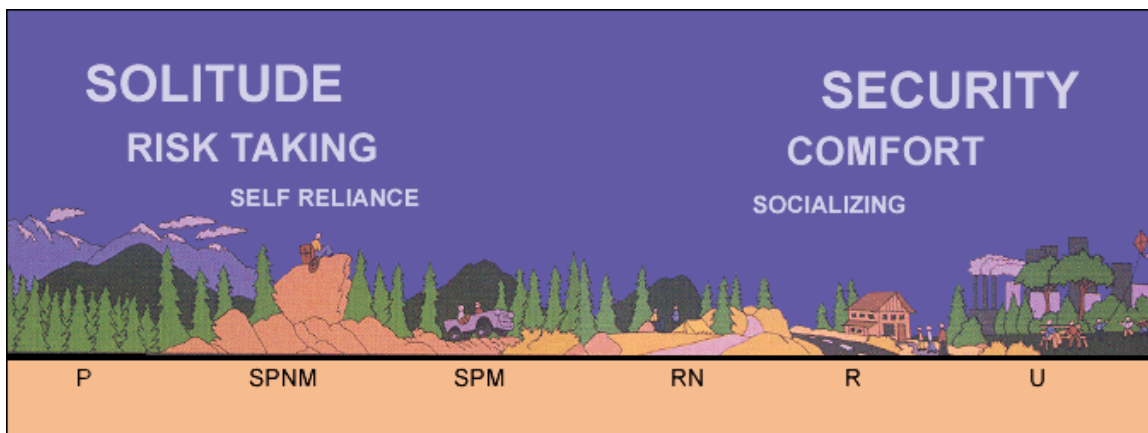
The Kachina Peaks Wilderness, located approximately 6 miles north of Flagstaff, is adjacent to the FWPP analysis area. The U.S. Congress designated the Kachina Peaks Wilderness in 1984 and it includes a total of 18,616 acres. The Wilderness is part of a large and heavily vegetated composite volcano, which bears signs of a rich geologic past that included violent eruptions and lava flows. Arizona's best examples of Ice Age glaciation can be found here in lateral and medial moraines and abandoned stream beds. Erosion and frost have helped shape this area. The only arctic-alpine vegetation in the state grows up here in a fragile two-square-mile zone.

Because of this delicate ecosystem, hikers must stay on designated trails, and no overnight camping or campfires are allowed above tree line (approximately 11,400 feet) or within the Inner Basin (City of Flagstaff watershed). Groups are limited to a maximum of 12 people.

Common recreational activities in Kachina Peaks Wilderness include hiking, horse-back riding, backpacking, cross-country skiing, snowboarding, snowshoeing, and hunting. The Wilderness encompasses most of the upper reaches of the San Francisco Peaks including Humphreys Peak, Arizona's highest point at 12,643 feet. Several USFS trails provide access to the Wilderness including Humphrey's Trail, Kachina Trail, Bear Jaw-Abineau Trails, and Weatherford Trail.

The Kachina Peaks Wilderness is in close proximity to the northern boundary of the project area – near the junction of FR 522 and FR 6273. There is an ad hoc trailhead at this road junction that provides access to the Kachina and Weatherford Trails located within the Wilderness area.

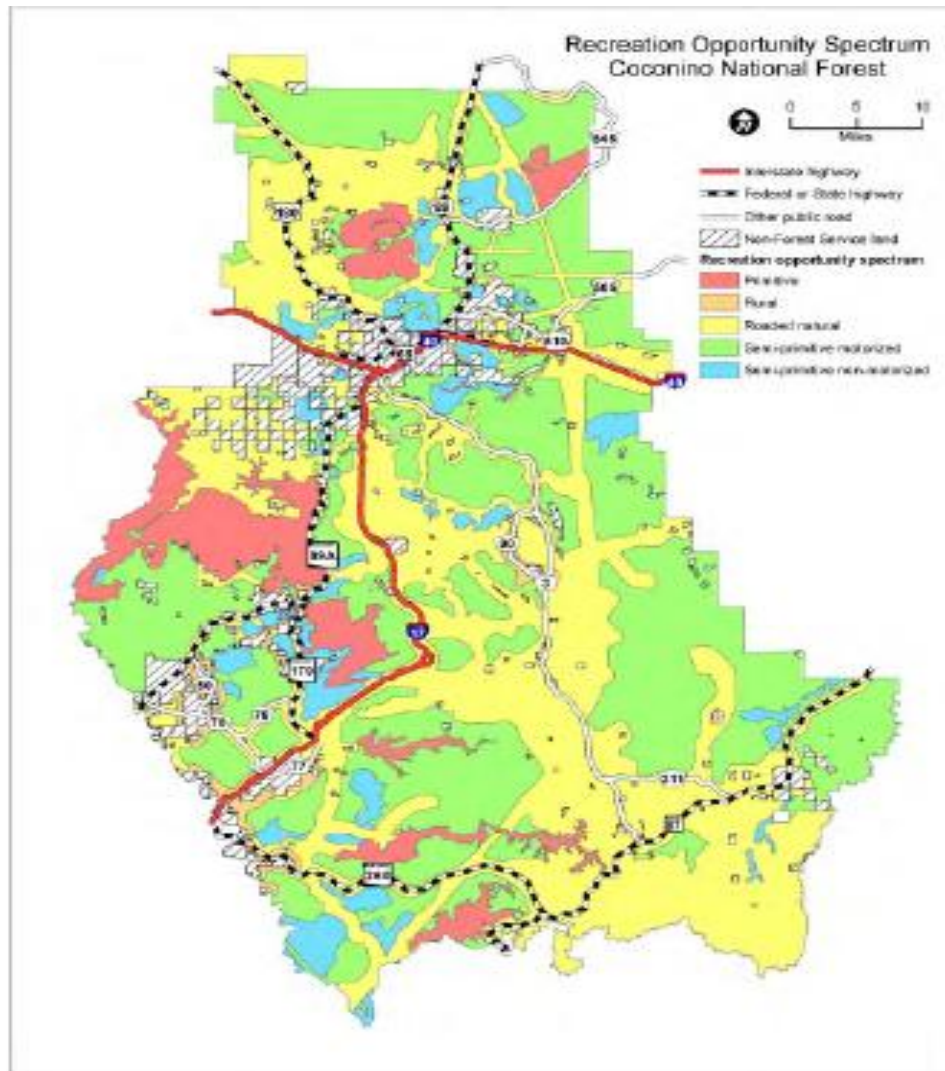
## Recreation Opportunity Spectrum



**Figure 7: Recreation Opportunity Spectrum, USDA ROS Primer and Field Guide 2011**

The Forest Service uses the Recreation Opportunity Spectrum (ROS) to provide a framework for defining classes of outdoor recreation environments, activities, and experience opportunities (USDA Forest Service, ROS Primer and Field Guide 2011). The ROS is a land classification system that categorizes national forest land into six classes, each class being defined by its setting and by the probable recreation activities the setting offers. The six ROS classes are: primitive, semi-primitive non-motorized, semi-primitive motorized, rural and urban. Opportunities for experiences along the spectrum represent a range from very high probability of solitude, self-reliance, challenge and risk, to a very social experience where self-reliance, challenge and risk are relatively unimportant (Figure 7).

The purpose of the ROS is to identify different parts of the forest to facilitate different recreational experiences. The ROS represents management objectives which may not always reflect actual user experiences. ROS zones for the Coconino National Forest are shown below (Figure 8). The Coconino National Forest is currently revising the Forest Plan, which could potentially change the ROS zones; however, the current draft of the revised Forest Plan does not reflect significant changes to the ROS classifications within the project area.



**Figure 8: Recreation Opportunity Spectrum designations on the Coconino National Forest.**

One of the key aspects of recreation management, as it relates to the ROS system, is the setting and how it is managed. Setting indicators include access (e.g. roads), remoteness (e.g. proximity to cities, towns, urban settings), naturalness, facilities (e.g. structures, signs, etc.), social encounters (e.g. frequency, group size, etc.), visitor impacts (e.g. trash, resource damage, etc.), and the visitors themselves (e.g. noise, vandalism, etc.). ROS zones can be modified and altered over time based on changing conditions with these indicators and other factors.

The ROS classifications within the FWPP analysis area include: Semi-Primitive Non-Motorized (SPNM), Semi-Primitive Motorized (SPM) and Roaded-Natural (RN). The Kachina Peaks Wilderness, located directly north of the project area is Primitive (P).

### **Road System**

The Forest Plan directs to “Provide and manage a serviceable road transportation system that meets needs for public access, land management, resource protection, and user safety. Provisions are made for the construction and reconstruction, maintenance, seasonal and special closures of Forest roads; and obliteration of unnecessary roads” (USDA FS 1987).

Forest Service roads within and/or adjacent to the Dry Lake Hills area that are heavily used by recreationalists include FR 420 (Schultz Pass Road), FR 522 (Freidlein Prairie Road), FR 557 (Elden Lookout Road), and FR 556 (Little Elden Springs Road). These roads provide recreationists with access to trailheads, dispersed camping sites, climbing and hang gliding locations, as well as hunting opportunities, recreational driving experiences, scenic and wildlife viewing, birding, and fuel-wood gathering. Forest roads are occasionally used for recreational special-use events (e.g. running or biking events), and also for shuttling purposes for activities such as downhill mountain biking (aka gravity riders).

FR 789 is a decommissioned road that begins at its junction with FR 420 (Schultz Pass Road). The old road location crosses Schultz Creek at this point and is currently closed with a gate. It then climbs to the mesa on top of the Dry Lake Hills and passes through a parcel of land owned by the Navajo Nation. The road passes close to the seasonal “dry lake” on the top of the Dry Hill Hills and terminates on the western edge of the mesa. Much of FR 789 is used as a trail by hikers, mountain bikers and equestrians – in particular, the segment from FR 420 to the top of the mesa where it serves as a link with Brookbank Trail. This portion of FR 789 is known as the “Little Gnarly Trail” by locals and trail guide maps/books. It is a popular route and is used on occasion for special-use running and biking events.

Forest Service roads within and/or adjacent to the Mormon Mountain area used by recreationalists include FR 90 (Mormon Mountain Road), FR 132, FR 132A, FR 240, and FR 248. These roads are used by recreationalists in a similar fashion as the Dry Lake Hills area, except there is no mountain biking shuttling activity. Also, FR 90 is a critical access road for Mormon Mountain Lodge, Saint Joseph’s Youth Camp, Dairy and Double Springs Campgrounds, private residents, and a number of recreation residence or cabins located on the national forest via a special-use permit.

### **Restricted Motor Vehicle Use**

The Mount Elden/Dry Lake Hills (approximately 8,500 acres) is designated in the Forest Plan for motorized use on designated routes only, with no off-road use permitted in those areas.

### **Urban Interface Activities**

As is the case in other urban interface areas on the Forest, there is a high level of recreational use of the Forest around the Flagstaff urban interface – the forest serves as the community’s backyard. Survey of the lands around the community boundary revealed the evidence of fairly intensive public use, with numerous social trails and illegally constructed trail features (i.e. jumps, BMX race tracks, etc.) and the occasional “fort” constructed by children. Much of the use is non-motorized, pedestrian use in the form of people walking, hiking, exercising, and walking pets from their homes. This use is endemic to such areas and often not problematic to other

resources such as wildlife, soil and water, etc., with some exceptions where such trails pass through sensitive wildlife habitat, archaeological sites or are the cause of erosion problems.

A review of legal easements and public access to National Forest System indicated that while all of the existing legal access points are in use by the public, there is also access to the Forest occurring across private lands in some areas.

The issue of trespass use of National Forest System lands exists across the project area along subdivision lines. In numerous locations along the property boundaries people have constructed unauthorized fences, out buildings, tree forts, illegal campsites, archery targets, etc. on National Forest System land.

In addition, there have been several incidents of vandalism, graffiti and damage to Forest Service trail signs and interpretive signs within the Mount Elden Environmental Study Area. Due to the limited personnel and resources as well as budgetary constraints, these issues have not been properly addressed for a number of years, and the problem has grown as subdivisions have increased.

### **Mount Elden / Dry Lake Hills Planning Project**

The Coconino National Forest is concurrently conducting an environmental analysis of non-motorized recreation for trails, special uses and facilities known as the Mt. Elden – Dry Lake Hills Recreation Planning Project, also referred to as MEDL. Much of MEDL planning area overlaps with the Dry Lake Hills portion of the FWPP area. There is the possibility that new temporary roads constructed under the FWPP could at a later time be converted to recreational trails. The EIS currently being prepared for FWPP will not analyze for the possible environmental effects of any future road to trail conversion within the project area. It will only analyze for the construction, use and rehabilitation of new temporary roads, not their possible conversion to a trail. If any road to trail conversion is considered under the MEDL environmental assessment, those environmental effects would be analyzed under the MEDL environmental assessment.

### ***Desired Condition***

Respond to the Forest Service's sustainable recreation strategy by implementing focus area "Restoration and Adaptation of Recreation Settings: Many of our recreation facilities and areas have deteriorated due to a lack of maintenance, high-volume visitor use, and natural processes such as fire and declining forest health. Others no longer fit the cultural values and use patterns of the populations they serve. This effort will restore and adapt settings and special places creating marked improvements in the condition of recreation sites and settings and a goal to eliminate the majority of deferred maintenance by 2019" (Forest Service, 2010).

A spectrum of high-quality outdoor recreation settings and opportunities will be available in the project area. Roaded Natural and Semi-Primitive Motorized ROS areas will provide high scenic and recreational values and in Semi-Primitive settings will provide more natural appearing settings. The national forest system lands in the project area provide high quality recreation opportunities and settings that compliment and support local communities' tourism industries, and contribute to local residents' quality of life. Management activities on national forest system lands are consistent with recreation setting objectives that provide opportunities for the public to engage in a variety of developed and dispersed recreational activities, in concert with other resource management and protection needs.

### *Relevant Laws that Apply*

Relevant laws that apply to recreation and wilderness management on the Coconino National Forest include:

**Multiple-Use Sustained-Yield Act of 1960 (1960)** –This act mandates that National Forests be "administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes," thus establishing outdoor recreation as a stated purpose of the Forest Service.

**National Forest Roads and Trails Act (1964)** –This act authorizes the construction and maintenance of a system of roads and trails on the National Forests for the purposes of use, protection, and management of these lands.

**Wilderness Act (1964)** –The act dictates that Wilderness is an area of Federal land that will be managed to retain its primeval character and influence. It is protected and managed so as to preserve its natural condition and the imprint of man's work must be substantially unnoticeable. This guides the management of the eight designated wilderness areas on the Prescott NF.

**National Trails System Act (1968)** –This act and its subsequent amendments authorized a national system of trails and defined four categories of national trails: National Scenic Trails, National Recreation Trails, National Historic Trails and Connecting or Side Trails.

**Arizona Wilderness Act (1984)** - This act expanded the National Wilderness Preservation System in the state of Arizona and established eight of the ten designated wilderness areas on the Coconino NF, including the Kachina Peaks Wilderness.

### **Forest Service Manuals**

2310.1 - Authority. Recreation planning on National Forest System lands is an integral part of Forest land and resource management planning as required by the Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974, as amended by the National Forest Management Act (NFMA) of 1976, and described in 36 CFR 219 and FSM 1920. The specific requirements of recreation resource planning are set forth at 36 CFR 219.21.

2310.3 - Policy. In addition to general planning policy presented in 36 CFR 219.1, FSM 1903, FSM 1920.3, FSM 1922.03, and FSM 2303. Use the Recreation Opportunity Spectrum (see existing conditions for a summary of the ROS classes) to establish planning criteria, generate objectives for recreation, evaluate public issues, integrate management concerns, project recreation needs and demands, and coordinate management objectives.

2320 – Wilderness Management – Policy. Where there are alternatives among management decisions, wilderness values shall dominate over all other considerations except where limited by the Wilderness Act, subsequent legislation, or regulations.

2350 – Trail, River, and Similar Recreation Opportunities - Policy. Consider trail management in the context of an administrative unit or Ranger District.

2353 - Administration of National Recreation, Historic and Scenic Trails. These extended trails are located so as to provide for maximum outdoor recreation potential and for conservation and enjoyment of the nationally significant scenic, historic, natural, or cultural qualities of the areas through which these trails pass (16 U.S.C. 1242(a)(2)).

2370 – Special Recreation Designations – Policy. Manage each special area as an integral part of the National Forest System with emphasis on the primary values and resources as directed by the law that established the area.

## Environmental Consequences

### *Methodology*

In addressing the recreation and wilderness conditions for the FWPP analysis area and the potential effects to these resources from the alternatives, the best available science was used, including relevant peer-reviewed literature, published reports from regulatory and land management agencies, existing resource inventories, field visits, and the professional judgment of the specialist(s). Literature and documents reviewed includes the Coconino National Forest Land Management Plan (Forest Plan) (USDA FS, 1987, as amended) and the draft revised Forest Plan. ROS classifications within the analysis area were referenced to determine if any modifications would be necessary given the alternatives.

### *Spatial and Temporal Context for Effects Analysis*

The timeframes for direct and indirect effects will include the potential for eight to ten years of project implementation, followed by a period of recovery lasting up to ten years. The analysis area for direct and indirect effects is the project area. The timeframe for cumulative effects is 20 years and the area includes the Flagstaff Ranger District of the Coconino National Forest.

### *Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis*

The following list of activities will be considered in the cumulative effects analysis.

		PAST	PRESENT (ONGOING)	REASONABLY-FORESEEABLE
DRY LAKE HILLS	Forest Thinning & Burning Projects	Fort Valley Experimental Forest (thinning & burning)		
		GFFP thinning around communication site		
		Wing Mountain Fuels Reduction Project		
		Eastside Fuels Reduction Project		
		Jack Smith Schultz Fuels Reduction Project (and ongoing)		
				4FRI
				Treatments on the Navajo Nation parcel as well as adjacent State and private land
	Wildfires	Schultz Fire (2010) 15,075 acres		
	Restoration Work	Schultz Reforestation		
		Schultz Sediment Reduction (acres)		
		Little Bear, Little Elden, and Deer Hill Trails Restoration– post Schultz Fire damage		
	Recreation	Travel Management Rule		
		Arizona Trail construction		
			Mt. Elden / Dry Lake Hills Trail System Mtnce.	
			Recreational Special-Use Events	
			Fort Valley Trail System Mtnce.	
				MEDL Planning

### ***Alternative 1 – No Action***

Under the No Action Alternative, recreation activities would be managed as they currently are without impacts from fuels reduction treatments associated with FWPP other than those approved under previous decisions (e.g. Jack Smith Schultz and Eastside Forest Health and Fuels Reduction Projects).

#### **Direct and Indirect Effects**

However, in the event of an uncharacteristic high severity wildfire such as the Schultz Fire (2010), the existing recreation infrastructure and activities could be drastically impacted.

For example, several trails were severely damaged by the Schultz Fire and subsequent flooding - including Weatherford Trail #102, Waterline Trail, Deer Hill Trail #99, Little Elden Trail #69 and Little Bear Trail #112 (see Figure 9).



**Figure 9 Little Bear Trail, Post-Schultz Fire, October 2010**



**Figure 10 Dead standing tree with little holding wood (right); picture from Waterline Trail damaged by Schultz Fire.**

These trails were closed during and after the Schultz Fire for public safety and for resource concerns. The Deer Hill Trail remains closed because many segments of the trail are considerably damaged; the trail will need to be relocated at a substantial economic cost before being re-opened. Also, the Little Elden Springs Horse Camp was closed during the Schultz Fire and subsequent flooding events.

For many months after the fire, standing dead trees were a serious public safety hazard because they are more susceptible to falling due to their charred condition. It can take several years for these trees to fall on their own accord depending on a number of variables: weather and atmospheric conditions (e.g. wind, snow loading, freeze/thaw cycles, etc.); topography (e.g. aspect, slopes, etc.); burn-severity (e.g. impact to root system, burned tree bole – cat face, etc.); and ongoing flooding. Trees with a detached limb or tree top have little holding wood and are referred to as “widow-makers” (Figure 10) because the object (e.g. detached limb) can become dislodged by wind and fall onto unsuspecting person(s) in the area.

The Schultz Fire caused a number of impacts to trails, but subsequent flooding events were more detrimental and resulted in more significant damage to the trails. Large debris flows removed major sections of the trail – often completing removing any evidence of a trail and depositing large boulders and debris onto the trail (Figure 11).

The threat of catastrophic wildfires is increasing due to un-managed vegetation which would severely impact recreation values and experiences – similar to the Schultz Fire (see also the Fire/Fuels Specialist Report). Fires of greater intensity and scope, including stand replacement fires, can result in changes to the landscape, its character, and visual quality. This would reduce or significantly diminish the quality of recreational settings and experiences that are desirable - including recreational driving, trail-use (e.g. hiking,



**Figure 11 Debris flow onto Little Elden Trail, Post-Schultz Fire.**

biking, horse-back riding), and hunting. Areas currently used for dispersed camping, recreation special-use events (e.g. running and biking events) and rock climbing would likely be unsafe and less appealing for these activities after such a fire – likely resulting in closures (short-term and long-term depending on the severity). Segments of the Arizona National Scenic Trail impacted by a wildfire would be closed until properly repaired and safe for use; this would result in the need to provide detours for outdoor enthusiasts on the state-wide trail. Recreational infrastructure such as trailhead restrooms, kiosks, bulletin boards, and trail signs would be damaged by a severe wildfire and would need to be repaired/replaced resulting in thousands of dollars of replacement costs.

## Cumulative Effects

The cumulative effects analysis area is the northern portion of the Coconino National Forest – above the Mogollon Rim. The timeline for analysis is 20 years because most long-term effects of the alternatives are assessed out to a 20 year timeframe (with the exception of large scale high severity wildfire which is more difficult to project).

The following is list of actions relating to recreation management and recreational activities considered in the cumulative effects analysis for this project:

- Past activities that created the current conditions include forest management practices related to timber harvest and fire suppression (i.e. Eastside Fuels Reduction Project, Schultz Fire), dispersed and developed recreation management – including construction of the Arizona Trail, Travel Management Rule, special-use events and outfitter guide operations.
- Present and future activities such as vegetation management (i.e. 4FRI projects), trails management – ongoing operation and maintenance of existing trails, and pending trail planning projects - Mount Elden / Dry Lake Hills Planning Project.

The cumulative effects of past management activities are visible as the existing conditions.

The short term cumulative effects (1-5 years) of the No Action alternative combined with similar current and future restoration treatments and prescribed burning projects are expected to be negligible, unless additional large scale, high severity wildfires occur in the northern portion of the Coconino National Forest. If a wildfire burned recreational infrastructure including USFS trails, dispersed camping sites, and recreational features (i.e. trailhead restrooms, kiosks, bulletin boards, trail signs, etc.), there would be long term negative changes (10 to 25 years). Trails impacted by a severe wildfire would be indefinitely closed for public health and safety reasons and it's probable such trails would be significantly damaged by subsequent flooding events. This would result in long-term trail closures; and possibly the need to close trails if considerably damaged beyond repair. Trail closures would displace trail-use to other trail systems in northern Arizona. In addition, a severe wildfire that impacts these trails would affect running and biking races (special-use events) for an extended period of time. These special use activities would no longer occur on these trails until they are properly repaired and safe for public use. This would result in such activities being displaced to other trail systems in northern Arizona. Furthermore, outfitter guiding operations such as climbing at West Elden would be unsafe and require the need to pursue other suitable locations. Trail use activities (hiking/biking) that are enjoyed by campers at St. Joseph's Youth Camp near Mormon Mountain would likely be lost if trails are severely impacted by a wildfire and flooding. In addition, it would cost hundreds of thousands of dollars to repair/replace damaged trails, trailheads, and other recreational infrastructure damaged by a severe wildfire and subsequent flooding. Finally, the Mount Elden / Dry Lake Hills Recreation Project would be affected by a severe wildfire; it would likely trigger drastic changes to the planning effort or result in terminating the project all together.

### Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

This alternative would not meet the project's desired conditions or forest plan direction. It would not move the project area toward Restoration and Adaptation of Recreation Settings. No action would result in the current wildfire risks and declining forest health and it is reasonable to assume that these risks increase each year and could be exacerbated by climate change. A severe wildfire within the project area would change the landscape and likely alter the Recreation Opportunity Spectrum – resulting in diminished scenic qualities and detracting recreational values.

### Irretrievable and Irreversible Commitment of Resources

This alternative does not propose changes and thus does not have any irretrievable and irreversible commitment of resources.

### *Common to All Action Alternatives*

#### Irretrievable and Irreversible Commitment of Resources

The action alternatives focus on reduction of fuels to reduce the threat of high severity wildfire and subsequent flooding in two key areas near the City of Flagstaff, Arizona: the Dry Lake Hills portion of the Rio de Flag Watershed north of Flagstaff, and the Mormon Mountain portion of the Upper Lake Mary Watershed south of Flagstaff. As such, there is no irretrievable or irreversible commitment of resources.

*Mitigation Measures and Design Features for Recreation and Wilderness***Public Notice / High-Use Visitation Days**

1. Provide advanced notice to the public to ensure that the public is aware of project activities - prior to and during vegetation and fire treatments. Utilize a number of public outreach methods such as issuing news releases, websites (forest and links to partnering agencies and non-profit groups), electronic sign boards, and post signage at trailheads, kiosks, and high-use recreation areas within the project area near public access points to highlight the proposed action.
2. Efforts would be taken to limit forest treatment activities within the project area during high-use weekends and holidays (e.g. Memorial Day, 4th of July, Labor Day, etc.); especially in locations where recreation based activities (e.g. trails, trailheads, etc.) occur.

**Road Management**

1. Consider dust abatement measures on dirt roads used for haul routes within close proximity to homes, cabins, camps, and other highly frequented recreation sites (e.g. trailheads, dispersed camping corridors, etc.).
2. Consider temporary closures or restrictions for identified MVUM dispersed camping corridors within the project area during implementation operations that may cause public safety concerns as well as negatively impact forest visitors camping experiences.
3. Temporary closures of forest roads and/or portions of the project area during implementation would be coordinated with Arizona Game and Fish Department during hunting seasons to reduce impacts on hunter.

**Trail Management**

1. USFS single-track trails would be avoided for use as a skid trail or temporary road.
2. Harvesting activities would avoid forest system trails, if possible. If it is determined necessary that a trail must be used as a temporary road or skid trail, then the trail would be restored to USFS standards post-treatment.
3. It is acceptable to make perpendicular trail crossings with mechanized logging equipment provided it is done on a limited basis and that the trail crossing locations are designated and flagged with input from the District Trail Coordinator or assigned personnel. Trail crossings would be restored to USFS standards post-treatment.
4. Crossing or using the Arizona National Scenic Trail as a skid trail will be done sparingly and only if no other alternative exists. These crossing locations will be coordinated with District Recreation Staff or assigned personnel.
5. Forest restoration treatments within close proximity (e.g. 100 ft. to 200 ft.) of forest system trails would consider “feathering” the treatment so the visual impacts are more transitional than abrupt – and as to not significantly change the character or experience of the trail.

6. When mechanical treatment and burning are occurring along open trails, slash will be pulled back immediately within 100 feet of the centerline of the trail corridor.
7. Character trees that have unique shape or form and trees that define the trail corridor should be retained where feasible and should conform to the applicable prescription. Avoid lines of trees; strive to achieve a groupy appearance to avoid abrupt changes in the landscape character along the trail corridor.
8. Retain trees within the turning radius of switchbacks and climbing turns of trails. These trees serve as visual cues for trail-users and reduce “trail cutting.”
9. Retain trees adjacent to the trail near a designed change in trail grade (grade-reversal). The precise location of these trees functions as a control to ensure the travel corridor of trail users. The trees are considered a key element of the trail feature (grade reversal) that functions to diffuse water off the trail.
10. Large, upright trail cairns used on the Beale Wagon Road (Trail) must be protected. Locate cairns ahead of time. Logging operations will not damage the cairns.
11. To hasten recovery and help eliminate unauthorized motorized and non-motorized use of skid trails and temporary roads, use physical measures such as re-contouring, pulling slash and rocks across the line, placing cull logs perpendicular to the route, and disguising entrances.
12. Generally restore control lines to a near undisturbed condition in the foregrounds (within 300 feet) of sensitive roads, trails, and developed recreation sites.
13. To hasten recovery and help eliminate unauthorized motorized and non-motorized use of control lines in these areas, use measures such as re-contouring, pulling slash and rocks across the line, and disguising entrances.
14. Do not use motorized equipment on National Scenic, Historic and Recreation Trails, or other forest system trails if these are used for control lines. Coordinate with the District Recreation Staff regarding use of National Trails as control lines.
15. Do not implement jack straw treatments within 1,000 feet of the Arizona National Scenic Trail.
16. Slash piles (mechanical and hand) will be a safe and reasonable distance (e.g. greater than 100 feet) from existing trails and recreation facilities (i.e. trailheads, parking areas, etc.).

**Special-Use Events**

1. Coordinated efforts would be made with sponsors of recreational special-use events (e.g. running or mtn. biking races) to minimize the impacts on such events within the project area during implementation. Alternative locations would be identified to meet the needs of the special-use event if forest management activities conflict with preferred locations and cannot be resolved through timing.

**Mt. Elden Environmental Study Area**

1. Measures would be taken to safeguard the trails and interpretive signs/markers within the Mt. Elden Environmental Study Area from forest restoration activities. Coordination with local school officials will minimize impacts on scheduled site visits by students.

**Wilderness Management**

1. Improve the wilderness boundary signing where forest restoration operations are planned within close proximity (e.g. ¼ mi.) of a wilderness area.
2. Forest restoration treatments within close proximity (e.g. ¼ mi. – ½ mi.) to a wilderness area would consider “feathering” the treatment so the visual impacts are more transitional than abrupt.

**Effects Common to All Action Alternatives*****Campfire Closure Order***

The proposed action includes establishing a permanent campfire restriction order in the Dry Lake Hills portion of the project area to limit the potential for human-caused wildfire. The current temporary campfire restriction order (Number 04-11-06-F) has been in effect since June, 2011 (reissued June 2013 for two years), and prohibits building, maintaining, attending, or using a fire, campfire, or stove fire (36 CFR § 261.52(a)). The Proposed Action would extend this order permanently in the project area.

**Direct and Indirect Effects**

The campfire closure order will impact recreationalists, most directly dispersed campers that would prefer to have a campfire throughout the Dry Lake Hills portion of the project area. The campfire closure order would likely result in less dispersed campers within the closure area because of campers seeking legal campsite locations to have a campfire.

**Cumulative Effects**

The campfire closure order would restrict campfires within the closure area indefinitely. This will displace the use of campfires to areas outside of the closure area. Also, the campfire closure order will help reduce the potential for human-caused wild fire and lessen the likelihood of a catastrophic wildfire that could cause severe destruction and severely impact recreation opportunities throughout the Dry Lake Hills area for 10 – 20 years and possibly beyond.

***Conventional Ground Based Harvesting***

Conventional ground based harvest systems (aka mechanical treatments) typically consist of several machines that all perform specialized functions. First a feller-buncher cuts the trees with a high speed disc saw and then places them into bunches for subsequent removal. Wheeled feller-bunchers are the dominant felling machines used in northern Arizona and operate well, up to approximately a 25% slope. Beyond 25% it is often necessary to use a tracked boomed feller-buncher that has leveling capability and is capable of operating on steep slopes. These leveling feller-bunchers can work on up to 55% slopes but very rocky ground can limit their operation.

A rubber tired grapple skidder then drags whole trees that have been bunched by the feller-buncher, to a roadside landing area. At the landing, a processor, removes limbs from trees and cuts them into log length. Finally, a loader places the logs onto a truck for transportation to a

mill. Logging slash, (limbs and tops) generated at the landing can be burned on site or chipped and removed as biomass. Conventional ground based harvesting is generally limited to slopes of 40% or less.

## Direct Effects

Conventional logging typically has some degree of short term to mid-term effects on recreational use and activities. During logging operations, areas would be closed to public access for safety purposes including roads, trails, and other recreation facilities (e.g. parking areas, trailheads, etc.). These temporary closures would directly affect a number of recreation activities such as driving for pleasure, dispersed camping, hunting access, trail use, special-use events (e.g. running and biking races, family re-unions, etc.), and outfitter guide operations (e.g. climbing).

Forest visitors wanting to drive within the project area will be directly impacted by temporary closures in locations closed to public access during logging operations. This will affect dispersed campers, hunters, and forest visitors driving for pleasure. Mechanical treatments will likely have temporary effects on the quality of the experience for some forest visitors. The immediate and substantial change in appearance of treated sites results in an effect on the visual quality of the recreation driving experience. Mitigation measures include efforts to reduce scenery impacts, and limit forest treatment activities within the project area during high-use weekends and holidays (e.g. Memorial Day, 4th of July, Labor Day, etc.) - especially in locations where recreation based infrastructure is located (e.g. trails, trailheads, etc.). Also, temporary closures of forest roads and/or portions of the project area during implementation would be coordinated with Arizona Game and Fish Department during hunting seasons to reduce impacts on hunters.

Mechanical treatments to sites in the area open to dispersed camping will likely result in immediate changes to the quality and quantity of camping opportunities for both short-term and mid-term. The disturbance from mechanical thinning (temporary and skid road construction and use, tree removal, ground vegetation disruption, slash piles, etc.) can disrupt both the aesthetic and physical qualities that make a campsite desirable, including for persons seeking shade, cover, etc. While sites could be rendered unusable by mechanical treatments, these effects will not be permanent, with use anticipated to increase in the mid to long-term. As initial ground disturbance heals, slash piles are burned and the beneficial effects of treatments become evident, the sites will likely be desirable again. In addition, there are other opportunities for dispersed camping outside the project area and within a short distance.

Logging operations in areas where Forest Service system trails exist will have immediate effects on the trails and the quality of recreational experience derived from them. The disturbance from mechanical thinning (temporary and skid road construction and use, tree removal, ground vegetation disruption, slash piles, etc.), while temporary, can impact sections of trails making them hard to follow and in some cases temporarily unusable. The duration of this effect is likely to last from a few months to possibly a few years – once the logging operations are concluded and trail rehabilitation work is completed. In addition, some trails may be used as temporary skid trails to move logs and slash – often resulting in ruts and damage to the trail tread (aka trail prism) and trail drainage structures (e.g. water bars, rolling dips, reverse grade, etc.). Also, logging skid trails that cross or bi-sect a Forest Service system trail may cause similar impacts and can affect the drainage of the trail resulting in increased erosion during implementation. However, after implementation, contractors would be required to return the roads and trails to their previous (pre-disturbance) condition, and BMPs would decrease impacts associated with harvesting activities, including erosion and rutting. Furthermore, mitigation measures will ensure

that the large, upright trail cairns used on the Historic Beale Wagon Road (Trail) will be located prior to logging operations and will be protected.

A number of trail mitigation measures and designed features were developed to minimize impacts - especially on the Arizona National Scenic Trail. These include: (1) crossing or using the Arizona National Scenic Trail as a skid trail will be done sparingly and only if no other alternative exists; (2) not implementing jack straw treatments within 1,000 feet of the Arizona National Scenic Trail; and (3) not using motorized equipment on National Scenic, Historic and Recreation Trails, or other forest system trails if these are used for control lines. Also, USFS single-track trails would be avoided for use as a skid trail or temporary road. Refer to pages 23-24 for the complete mitigation measures and design features for trails.

Social or unauthorized trails within the project area where logging operations occur will be directly impacted by mechanical treatments. Segments of these unauthorized trails will be affected by the development of temporary roads, skid trails, and roadside landings. The impacts from mechanical treatments to segments of unauthorized trails will result in ground disturbance, tree removal, and vegetation alterations. It is anticipated that such unauthorized trail segments will no longer be usable during and after logging operations as the contractor would not be required to return unauthorized trails to their pre-disturbance condition. There are no design features to rehabilitate unauthorized trails post-treatment.

Special-use activities, such as running or biking events, that use trails or sites that are closed to public access during logging operations will be directly impacted. Also, permits will not be issued for family re-unions or other group activities within the project area during logging operations to ensure public health and safety. A coordinated effort will be made with sponsors of recreational special-use events to minimize the impacts on such events within the project area during implementation. Alternative locations would be identified to meet the needs of the special-use event if logging operations conflict with preferred locations and cannot be resolved through timing.

Direct effects on rock climbing use from treatment activities will be minimal and of short duration. It is likely that treatments in climbing areas will consist of hand thinning some trees, mechanical pilling of slash, and burning. These activities will cause only temporary disturbance to rock climbing opportunities from noise and will only minimally and temporarily impact visual quality.

Logging operations proposed within the urban interface will have the immediate effect of noise and public safety hazards during mechanical treatment, and the disturbance to social trails and routes used by the public from vegetation removal, slash piles and other treatment effects.

Mitigation measures and designed features, as outlined on pages 22-24 and those provided by the scenery specialists report, will be implemented to minimize the impacts on forest visitors and recreational activities.

## Indirect Effects

An indirect effect of conventional logging may result in the development of unauthorized trails as a consequence of temporary roads and mechanized skid trails. For timber extraction, temporary roads are created and rubber tired grapple skidders are used to drag whole trees to a roadside landing area – creating a skid trail. Once the logging operations are completed, these temporary roads and skid trails can inadvertently become unauthorized trails used by a number of forest

visitors including hikers, mountain bikers, equestrians, ATV enthusiasts, and motorcyclists. Mitigation measures to address this potential impact include the use of physical measures such as re-contouring, pulling slash and rocks across the line, placing cull logs perpendicular to the route, and disguising entrances onto temporary roads and skid trails to hasten the recovery.

Roadside landing areas used for logging operations become trampled and denuded of vegetation. A short duration after logging operations are completed (i.e. 2-3 years) these landings become a desired dispersed camping/parking area for forest visitors. Additionally, forest visitors gathering fuel wood congregate to these areas because of the open access and abundance of slash and woody material.

It is likely that, in the short term (up to 1-2 years after mechanical treatment) that dispersed camping use will be displaced to other sites both inside and outside of the project area by the treatment activities. As a result of this displacement, use of existing sites that are not planned for treatment within the project area and sites outside the project area may see increases in use. This use is likely to lead to some effects to these sites from the increased use. However, as the overall amount of dispersed camping use to be displaced is relatively low, the associated effects of displace to other sites can also be seen as insignificant.

Logging operations should not have a major effect on restricted motor vehicle use for the Mount Elden/Dry Lake Hills area, although the opening up of sites of trees will indirectly allow easier access for persons wanting to drive off road, and thus make it somewhat more difficult to administer and enforce off-road vehicle restrictions.

#### *Hand Thin and Pile*

Hand thinning usually has little or no short term effects on recreation management. Trees are cut down, and then cut (lopped) into smaller lengths that are collected and stacked for future pile burning. Project design features require most slash piles to be a safe and reasonable distance from trails and recreation facilities. Similar to roadside landings, forest visitors seeking fuel wood opportunities will likely harvest hand piles to remove logs and branches. Hand thinning and pile burning within the Mount Elden Environmental Study Area will help restore natural conditions. In the short-term (1-2 years) these operations will detract from the user experience due to visual impacts; however in the mid-to-long term (3-20 years) it will enhance the experience of those visiting the area by reducing the likelihood of a catastrophic fire and improving the diversity of vegetation and scenery.

#### *Cut to Length*

The cut to length (CTL) harvest system consists of a harvester that cuts trees with a bar saw and then, without releasing them from its cutting head, de-limbs and processes them into logs.

Limbs and tops are placed in front of the machine and are crushed down as the harvester moves ahead. A forwarder (Figure 13) then follows in the harvester's trail and loads the cut logs into log bunks on the machine. These logs are carried to a roadside landing free of the ground. Repeated trips by the forwarder on the trail crush the slash into the ground.

If it is desirable to remove more of the slash, it is possible to only process the tree to the extent



**Figure 13 Forwarder working on steep slope**

needed to get it on the forwarder. In some instances it may be possible to not process the tree at all and take it to the landing in tree length form. The stem then must be processed into logs at the landing. This double handling of the log by the harvester to cut and then later process the tree reduces the cost- effectiveness of the method and does not place slash on the skid trails.

In the past CTL has been limited to slopes of approximately 40 percent; however recent developments in technology now allow some models of harvesters and forwarders to operate on slopes of up to 65 percent slope for downhill forwarding and 45% uphill. Rocks that protrude from the ground over about 12 inches limit operability; however rocks that are embedded in the ground without a vertical side above ground do not impede operation greatly.

On steep or rocky slopes a steep slope excavator (called a Spider) may be used to treat vegetation. While they are most often used as an excavator for piling or digging, they can be equipped with a harvester head and can cut, buck and pile standing trees. Their legs operate independently and they push themselves uphill with a boom. They can maneuver around and over fair sized boulders that would limit operations of other machines such as harvesters and feller-bunchers. They are a very specialized machine that is uncommon, especially in northern Arizona.

### Direct and Indirect Effects

The effects of steep slope harvesting equipment would be similar to the ground based logging noted above. However, large rocks and other debris could become dislodged and move downhill from the equipment onto trails and roads below the harvesting operation. Project mitigation measures require the trail and road to be closed to public access during operations and that FS system trails are restored to USFS standards post-treatment.

### *Aspen Treatments*

Aspen treatments to stimulate new sprouting require protection from ungulate browsing following treatments. A variety of treatments would be used including removal of invading conifers within 100 feet of aspen clones, prescribed fire, ripping, planting, fencing and/or cutting of aspen to stimulate root sprouting. Many aspen clones currently have dead and down and dead standing trees. Treatments would not be very noticeable with the exception of fencing which would not impede or cross a FS system trail when constructed. Thus there would be no direct or indirect effects on recreation use or activities.

### *Grassland Treatments*

These treatments would involve removal of encroaching conifers and restoration of presettlement tree density and patterns. There would be no effects to recreation management with these treatments.

### *Electronics Site Structure Protection*

Treatments around the telecommunication sites would be thinned. These are permitted facilities that provide important services to the public and they need to be protected. These locations would be thinned to 20 to 40 basal area. These treatments would not affect recreation management.

### *Pile Burning*

Effects from pile burning would be primarily limited to the immediate dead and live fuels of the slash pile, although some scorching and mortality of residual trees would be expected. Following burning, the bare areas are susceptible to invasive species. Mitigation measures for invasive species will monitor and treat infested areas. The areas are expected to re-vegetate within 1 to 3

years following burning. If areas where piles were burned are not naturally restored, it may be necessary to scratch in seed and soil from unburned areas in order to get vegetative cover.

### Direct and Indirect Effects

Pile burning treatments will have little effect on recreation management; it may require areas to be closed to public access during operations if public safety is a concern. Design features will ensure piles are at a safe and reasonable distance from trails and recreation facilities.

#### *Prescribed Fire*

Prescribed fire would be used on much of the project areas with the procedures tailored to fit the treatment types. Fire may be used in conjunction with mechanical treatments or singly. The objective of prescribed burning is to reduce fuel loading, raise crown base heights and reduce live tree density. Repeat or maintenance burning would help maintain these objectives. Repeat burning in ponderosa pine would occur every five to seven years. In mixed conifer on steep slopes, there may be only one broadcast burn because of the difficulty of implementation in these fuel types and terrain, and because the historic fire return interval is historically longer than the life of this project.

### Direct and Indirect Effects

Depending on fire severity, effects would include: charred soil and vegetation immediately following burning; charred bark up to 10 feet from the ground; needle and leaf scorch typically less than 20 feet from the ground; and, loss of understory trees, trees with old scars or trees with large accumulations of dead fuels at their base. In areas of moderate to high severity, openings may be created as a result of more extensive tree mortality.

Prescribed burning creates short term and temporary effects on recreation opportunities. Areas where these treatments are implemented may be closed to public access during operations for safety purposes. This may temporarily alter vehicular access (i.e. driving for pleasure, hunting, etc.), trail use, and other recreational activities such as dispersed camping and climbing. Recreationalists will not be able to access areas that are closed during burning operations. In addition, it may affect special-use events (e.g. running and biking races). Design features include working with event coordinators to minimize the impacts on such events within the project area during implementation. Alternative locations would be identified to meet the needs of the special-use event if forest management activities conflict with preferred locations and cannot be resolved through timing.

It's anticipated that prescribed burning operations will have the indirect effect of displacing general forest use short distances spatially as users (i.e. hikers, joggers, dog walkers, mountain bikers, equestrians, etc.) avoid slash piles, stump holes and other effects of treatment. As a result new social trail networks could evolve.

Also, smoke from prescribed fire operations can negatively impact the health of forest visitors in the immediate area; especially people with respiratory problems. This could affect dispersed campers, hunters, and trail-users near the prescribed fire operations. However, direct effects of initial and maintenance burning on dispersed camping would be minimal and short term. Generally campers in areas to be burned are informed about the burning operation and are asked to leave for the duration of the burn for their safety. Smoke from burning could cause discomfort to campers in the project area during burning but usually disperses within 24 hours. For the duration of a few months after initial and maintenance burning, ash on the forest floor is likely to make camping less pleasurable as it tends to blow in light breezes and stick to surfaces like shoes,

tents and clothing. During implementation, smoke would obscure views of the surrounding terrain and mountains. Effects to residents and visitors in the project areas may be dissatisfaction that their views are obstructed, and scenic features are obscured. Very smoky conditions typically occur during the first entry of prescribed burning due to heavy fuel loadings. There can be lingering smoke for two weeks to a month after burning as stumps, large logs and roots smolder. Smoke from repeat burns should lessen, since less fuel would be consumed.

There may be indirect effects of smoke as well since it drifts and is pushed by air currents. Nearby developed recreation sites, houses and subdivisions, and the communities may experience reduced visibility and smoky conditions. Dispersed campers and other recreationists may experience reduced visibility and smoky conditions in some places near the project area.

### *Transportation System*

Existing roads would be used to the extent possible for hauling harvested trees. Forest Roads (FR) 420, 556 and 557 would be used as the main haul routes for Dry Lake Hills; FR 132, 132A, and 648 would be used as the main haul routes for Mormon Mountain. Maintenance on these roads would be necessary prior to implementation, including reconditioning and resurfacing of FR 420, 556 and 132. In addition, there may be a need to transport harvested trees through the City of Flagstaff to access the Interstate system (I-40 and I-17).

However, it is likely that not all treatment areas would be accessible by existing roads. Approximately 17 miles under Alternative 2, 13 miles under Alternative 3, and 10 miles under Alternative 4 of temporary roads may need to be constructed to assist with tree harvesting and removal. Where possible, temporary roads would be located on existing road prisms (e.g. where historic road beds are still identifiable); however new temporary roads in previously undisturbed areas are also anticipated. The locations of temporary roads are estimated based on treatment areas. The precise location of temporary roads cannot be determined until a contract for treatment is secured and the type of equipment to be used is determined; however no temporary roads would be located within Mexican spotted owl nest cores. All temporary roads, landings, and skid trails used would be pre-approved by the Forest Service Timber Sale Administrator in accordance with resource protection measures.

All temporary roads would be rehabilitated after harvesting has been completed, which may include lopping and scattering slash, ripping or other closure and rehabilitation methods. However the Mount Elden/Dry Lake Hills Recreation Planning Project proposed action may include proposing road-to-trail conversions for some of the temporary roads if the locations meet the purpose and need for that project. Applicable Coconino National Forest Management Plan (Forest Plan) direction, Best Management Practices (BMPs), Forest Service Manual and Handbook direction, as well as standard mitigation measures would be implemented.

### **Direct and Indirect Effects**

Road maintenance activities would improve the condition of the existing road system. This would have a direct short-term impact on forest visitors that intend to use the forest roads being maintained as these roads will be closed during maintenance operations. This will affect vehicular access for a number of different recreational activities including driving for pleasure, dispersed camping, hunting, climbing, special-use events, and trailhead access where applicable. Also, it will impact the many recreationists that drive to top of Elden Lookout road (FR 556) to enjoy the views, picnic, access trails, hunt, hangliding, and those shuttling mountain bikes for downhill mountain biking. However, the road maintenance will benefit forest visitors accessing the area in vehicles in the mid and long term by improving road conditions.

Construction of temporary roads (approximately 17 miles under Alternative 2, 13 miles under Alternative 3, and 10 miles under Alternative 4) would result in moderate effects on recreation use and activities. The temporary roads, where they cross existing FS system trails and unauthorized trails, will close those segments of the trail and disrupt that use during logging operations; although the temporary roads would be rehabilitated after the thinning treatments are completed. Design features would be used to close entrance points and Best Management Practices for watershed would ensure drainage is re-established and the roads can rehabilitate. The temporary roads would begin to recover and should be mostly recovered and less noticeable to the casual observer in 5 to 10 years after the project is completed, and the roads are rehabilitated. It would be anticipated that the temporary roads may receive inadvertent trail use post-treatment; this may include non-motorized and motorized use.

Road decommissioning of four miles of roads would entail some or all of the following actions: rip and seed or mulched with slash, inside ditches filled, road prisms outsloped, culverts and fill materials removed, stream crossings re-contoured, unstable sidecast or cutslopes removed or stabilized, and entrances blocked to prevent future access. These would have moderate short term and mid-term effects to recreation activities; especially unauthorized trail use. Design features would help assure these roads to a more stable status. The obliterated roads would begin to recover after treatment and would be mostly recovered and less noticeable to the casual observer in 5 to 10 years.

### Cumulative Effects

Predominant semi-primitive non-motorized and semi-primitive motorized recreation settings, with some less highly developed settings in the area, will add to the presence of the desired wildland recreation setting in the surrounding landscape. Surrounding areas are also likely to maintain and enhance some semi-primitive settings. The exact amount is unknown, but subsequent project work in these areas is intended to continue this trend.

Although it is difficult to estimate where displaced campers may go, it's predicted that major forest roads outside of the treatment areas may see increased use, although this should not be a significant displacement, since there is not a significant amount of overnight camping in the project area now. As the current and historic camping use in the project area has been dispersed in nature, it is reasonable to assume that displaced campers will continue to seek this type of use here and in other areas. Displaced campers may add to current camping impacts in locations adjacent to the project area causing a slight increase in resource impacts.

Similar to the displacement of dispersed campers, trail users will pursue other opportunities outside of the treatment areas. It is anticipated that adjacent trail systems near Mount Elden such as Fort Valley and Campbell Mesa will experience an increase in use as displaced hikers, mountain bikers and equestrians become more familiar with these opportunities.

The cumulative effects of a wildfire would likely be more extensive than those of prescribed or management ignited fire, as wildfires tend to burn with greater intensity. The area affected by a fire would likely be less desirable for recreational activities, affecting the setting and users' experience. The area would likely be closed until it was safe to re-enter and rehabilitation work was completed. Should a high intensity fire occur, many recreation activities might be displaced to the surrounding landscape, adding impacts to surrounding lands and increasing competition and possibly conflict between users.

## Alternative 2 – Proposed Action with Cable Logging

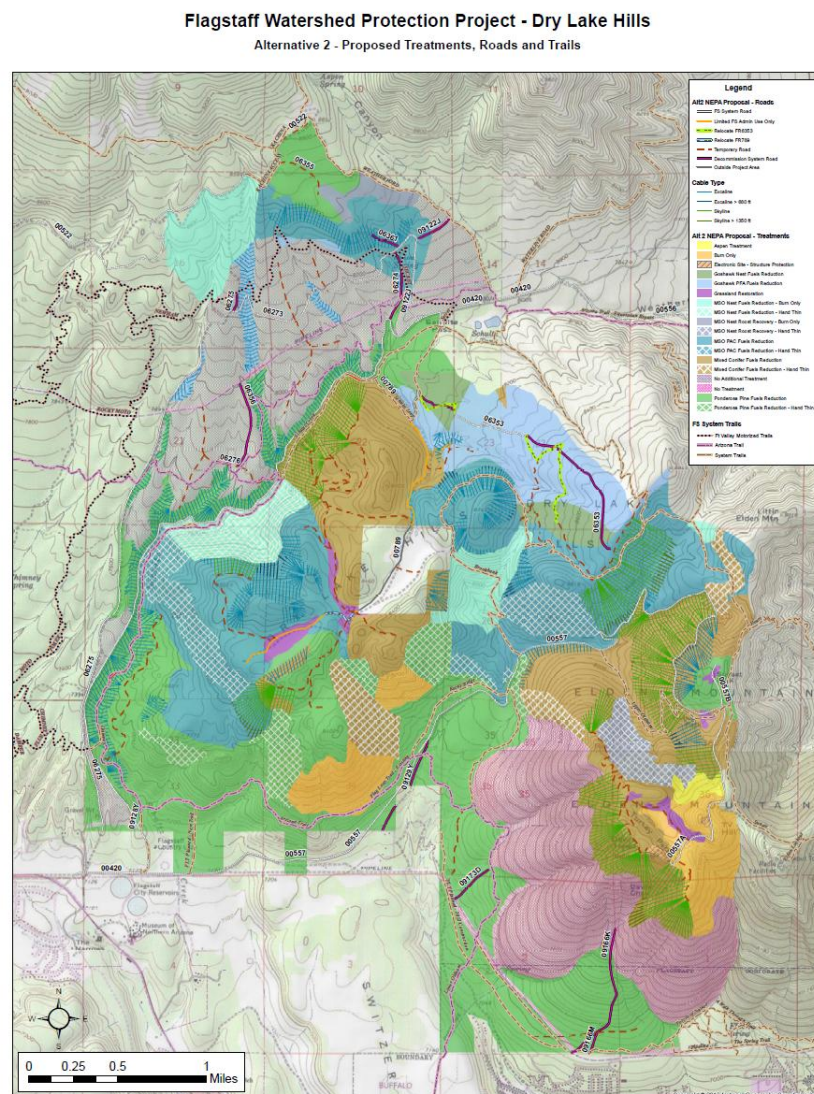
In addition to treatments common to the action alternatives noted above, alternative 2 proposes to use mechanical treatments on steep slopes using cable logging systems.

Cable logging systems are used to transport cut logs to centralized processing areas. Trees are cut and limbed, and then cables pull the trees to the landing area. Many cut trees are transported along a common corridor which can be up to 1000 feet long and are about 12 feet wide. In order to remove trees in a large area, corridors would be established about every 100 to 140 feet. Effects typically include scraping and loss of limbs on remaining trees as a result of adjacent trees being felled or transported, creation of linear corridors, slash, creation of large, cleared landings where logs are decked and equipment can be accommodated (moved and turned). Following log removal, activity slash must be treated. Methods may include bunching and piling slash mechanically which can trample vegetation and cause bare soil to be exposed, hand piling, and lopping and scattering.

### Direct Effects and Indirect Effects

Under Alternative 2 the direct and indirect effects will be the same as those identified in the effects common to all action alternatives section above, but the addition of cable logging operations will most directly impact trail use and aesthetics within the project area. The 12-foot wide cable logging corridors would directly impact existing USFS trail and unauthorized trail activities where they intersect.

The adjacent map (figure 12) shows the location of USFS trails and the proposed cable logging locations.



**Figure 12: USFS road and trail map with cable logging locations.**

USFS trails that will be directly impacted by cable logging operations includes a good portion of Schultz Creek Trail, three segments of Brookbank Trail, Upper Oldham Trail, and Secret Trail near FR 6273 (see table 7).

**Table 7: USFS trails with segments located within proposed cable logging locations.**

Trail Name	*Length (mile)	Description of trail segment location and type of Logging Operation (Skyline or Excaline)
Schultz Creek	1.9 mi.	Two different segments of the trail within cable logging locations. (1) Southern portion near jct. of Rocky Ridge Trail = 1.1 mi. – Excaline (2) Northern portion near jct. of FR 789 = 0.8 mi. – Skyline
Brookbank	1.0 mi.	Three different segments of the trail within cable logging locations. (1) Sunset Trail jct. to the southwest = 0.5 mi. – Skyline (2) Northeast of Dry Lake area = 0.4 mi. – Excaline (3) Directly east of Dry Lake area = 0.1 mi. – Excaline
Upper Oldham	0.68 mi.	Trail segment is in the upper portion of the trail – Skyline
Arizona	0.36 mi.	Trail segment due east of FR 6356 - Excaline
Secret	0.25 mi.	Trail segment is located north of FR 6273 – Excaline

\*Denotes approximate length of the trail located within the proposed cable logging locations.

There are a number of unauthorized trails that will be directly impacted by the cable logging corridors as well; many of which have been named by local trail enthusiasts – including Middle Oldham, Steel Reserve, Private Reserve, Upper and Lower Wasabi, Jedi, Double D as well as others. The areas and trails being treated with cable logging systems will need to be closed to public use for public safety concerns during operations. The trail tread, soil and vegetation near these trail intersections would be significantly disturbed by the cable logging operations. This will disrupt trail use and other recreational activities in these areas during logging operations and likely until the sites can be properly rehabilitated and restored. In addition, the cable logging operations will directly affect the aesthetics in the areas being treated which will impact the experience of forest visitors – especially those driving for pleasure seeking desired viewsheds (see Scenery report).

In addition, the hanglider launch pad above Devil's Chair on Mount Elden is located adjacent to a cable logging location. This would require the launch pad to be closed, impacting the use by hanggliders and paragliders during logging operations. Also, it may result in disturbance to the surrounding soil and launch pad itself.

USFS trails within close proximity to cable logging locations will be indirectly affected by this activity as it will impact use (e.g. trail closures during operations), accelerated gravitational erosion and debris onto the trails as a result of cable logging operations, and a change in the vegetative composition which will affect the aesthetic value of the area to those using the trails. The following trails have a significant segment of the trail located within 500 feet of cable logging locations (Table 8).

**Table 8: USFS trails with segments located within 500 feet of cable logging locations (CLL)**

Trail	General description of trail segment location
Arizona	Several segments of the trail are near CLL, especially just north of FR 789.
Schultz	Most of the trail is located within or close proximity to CLL.
Secret	There are a couple of segments near CLL – primarily near Orion Spring.

Sunset	There are two segments near CLL – near the jct. of Brookbank Trail and near the Oldham Park area.
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In addition, FR 420 and FR 557 are adjacent to cable logging operations and will have similar direct and indirect impacts as those using the trails. This will affect a number of recreational activities including driving for pleasure, hunting, and dispersed camping.

### Cumulative Effects

The cumulative effects for alternative 2 are the same as those identified in the Effects Common to All Action Alternatives section, but would also impact the MEDL planning project. The MEDL proposed action includes new trail construction, relocation of existing FS trails, incorporation of some user created trails (i.e. downhill mountain bike trails), an access trail for climbing at West Elden, and improving an existing hanglider launch pad in Turkey Park area. All of these proposed actions are either completely located within or have a significant portion located within the cable logging corridors and would be affected by such activity.

### Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

#### Forest Plan Amendments

The Coconino National Forest is currently operating under the 1987 Coconino Land Management Plan (Forest Plan), as amended; however the Forest is in the process of revising the Forest Plan, with the Record of Decision (ROD) for the revised plan anticipated for release in early 2015. Depending on the timing of the release of the final Forest Plan document, the final FWPP analysis will be consistent with the revised Forest Plan. The following three project-specific, non-significant Forest Plan amendments would only be required if a decision for this project is signed prior to implementation of the revised Forest Plan. In other words, no Forest Plan amendments would be anticipated if FWPP is implemented under the revised Forest Plan.

Three project-specific, non-significant amendments to the Coconino National Forest Land Management Plan (Forest Plan; 1987, as amended) would be required to implement the proposed action. A site (project) specific plan amendment is a one-time variance in Forest Plan direction for the project; Forest Plan direction reverts back to its original language/direction upon completion of the specified project. The language proposed does not apply to any other forest project.

A revised MSO Recovery Plan, issued by the U.S. Fish and Wildlife Service (FWS) was finalized in December of 2012 (USDI 2012). The current Forest Plan is consistent with the previous MSO Recovery Plan (USDI 1995). For this project, a Forest Plan amendment would be needed to utilize the revised recovery plan direction if it is different than what is currently included in the Forest Plan. The proposed Forest Plan amendments include:

**Amendment 1:** Modify Forest Plan language to allow mechanical treatments in MSO PACs up to 18 inches dbh and hand thinning treatments up to 9 inches dbh and prescribed burning within MSO nest/cores. The monitoring requirement specified under the Forest Plan would be amended to include the monitoring plan developed by the Forest Service, U.S. Fish and Wildlife Service, and the Rocky Mountain Research Station referenced in the following section titled, “Monitoring.” This amendment would also remove timing restrictions within MSO PACs for the duration of the FWPP project. Treatments within PACs would be accomplished as quickly as possible to reduce the duration of impacts, and would be coordinated with FWS. The purpose of

this amendment would be to facilitate treatment in high-priority locations such as Mexican spotted owl occupied habitat to prevent high-severity wildfire. This is based on language in the Mexican Spotted Owl Recovery Plan (2012), which states, “[wildfires] result in the most significant alteration of owl habitat and hence, have the greatest potential for loss of habitat.”

### *Effects to Recreation Management*

Amendment 1 would have a positive effect for the project and enhance scenic attributes within the areas being treated. This will improve recreational activities and experiences, especially for those driving for pleasure enjoying scenic views. USFS trails within these areas would be closed during treatment operations for public safety—resulting in a short-term impact to trail users. Mitigation measures for such trails would be employed during and post treatments to alleviate any alterations to the trail as a result of the operations.

**Amendment 2:** Removing language restricting mechanical equipment to slopes less than 40 percent and language identifying slopes above 40 percent as inoperable. This amendment would allow mechanical harvesting on slopes greater than 40 percent within the project area.

It would be necessary to allow for use of specialized mechanical equipment to cut and remove trees on steep slopes to reduce the risk of high-severity wildfire in this project area due to the preponderance of areas with greater than 40 percent slope in the project area. Furthermore, since the Forest Plan was written and amended, mechanized ground-based equipment has progressed to be able to operate on steep slopes more effectively. While this specialized equipment is not commonplace in this region due to the high cost of its use, the approval of the City bond makes the use of such equipment a possibility for this project. In order to be able to utilize such equipment to treat slopes above 40 percent in the project area and meet the purpose and need, this Forest Plan amendment is needed.

### *Effects to Recreation Management*

Use of specialized equipment to treat steep slopes would result in minimal impacts to recreationalists. It would require the closure of trails for public safety as noted above and in areas where trails and other recreation infrastructure is located. However, user created or unauthorized trails within these areas will be impacted by treatments. These unauthorized trails will not be rehabilitated after the treatment is completed and will likely result in displacing this type of activity.

## ***Alternative 3 – Proposed Action without Cable Logging***

Alternative 3 would include the effects common to all action alternatives and would employ helicopter logging.

Alternative 3 would be similar to Alternative 2 in that the described treatments and desired conditions would be the same; however this alternative would address visual concerns and distribution of snags and large trees due to the absence of proposed cable corridors. Under Alternative 3, treatments would utilize ground-based harvesting across the majority of the project area, with helicopter logging for critical areas that are too steep, rocky, or inaccessible to be treated by steep slope ground-based equipment. No cable logging would occur under this alternative, which would reduce the need to remove the large trees and snags on steep slopes and also the need to create corridors. The enclosed cabs of steep-slope machinery precludes the need to remove hazard trees, and though areas proposed for treatment by helicopter would still need to have hazard trees removed, the distribution of snags and large trees could be factored into

treatment placement more easily. Roughly the same number and mileage of temporary roads are anticipated for this alternative, and the same design features would apply as for Alternative 2.

**Helicopter Yarding:** Trees are felled either by hand or mechanically and then lifted free of the ground with a helicopter equipped with a 150-200' long line and flown to a roadside landing. Either logs or whole trees may be removed. However, flying whole trees with limbs and tops attached can significantly raise logging cost, as limbs and tops have little to no commercial value and are expensive to fly. Helicopter yarding is an extremely expensive method due to the high cost of operating a helicopter. If whole trees are flown, the tree is processed at the landing area with a processor.

Helicopter systems transport logs or trees to central log decks. Helicopter logging typically does not have a significant effect to recreation activities. Trees are typically cut and limbed, but it is possible to transport whole trees. Logs would have cables attached, then would be lifted up and transported away from the cutting area to central locations (log decks) where the logs are detached from the cables. If whole trees are transported, they must be limbed at the log deck creating very large quantities of slash. Equipment such as grapplers are used at the log decks to stack logs and load them into trucks for transport. Effects include scraping and loss of limbs on existing trees as a result of adjacent trees being felled or transported, creation of large, cleared landings where slash may be piled, logs are decked and equipment can be accommodated (moved and turned) and helicopters can be landed. Following log removal, activity slash must be treated which may include bunching and piling mechanically which can trample vegetation and cause bare soil to be exposed, hand piling, and lopping and scattering. The effects of slash treatment are short term depending on how slash is treated. Hand piling creates noticeable piles, but after these are burned, there is a shorter recovery time than with mechanical piling. Lop and scatter results in untreated slash since it is allowed to remain in an area until it is burned. Ryan (2005) found this is not as acceptable as when slash is treated either by chipping or piling. Mechanical piling may include bulldozers pushing slash into large piles which can trample vegetation and cause bare soil to be exposed. When these large piles are burned the soil can be sterilized lengthening the time needed for the burned areas to rehabilitate.

### Direct and Indirect Effects

Alternative 3 would not have the impacts on recreational activities identified in the previous section from cable logging. However helicopter logging would likely increase the need for area closures for public safety because of the inherent danger with this type of activity. There may be an additional need to secure the closed areas from forest visitors to ensure public health and safety concerns.

### Cumulative Effects

The cumulative effects for alternative 3 are the same as those identified in the Effects Common to All Action Alternatives section.

### *Alternative 4 – Minimal Treatment Approach*

This alternative would be similar to Alternatives 2 and 3; however the purpose of Alternative 4 is to analyze the minimum amount of treatment necessary to meet the purpose and need. Alternative 4 incorporates the Large Tree Retention Strategy (LTRS) provided by the Center for Biological Diversity during the scoping period for this project. Under Alternative 4 there would be approximately 13 miles of temporary roads constructed; 10 miles in the Dry Lake Hills area and 3 miles in the Mormon Mountain area. Treatments are proposed for those areas with dense fuel

loading where topography aligns with dominant winds and the probability of severe effects to soil resources from a wildfire is greater, based on FLAM MAP 5.0 modeling of both fire behavior and fire spread under Schultz fire weather conditions.

### **Direct and Indirect Effects**

Alternative 4 would have similar effects as those described in the Effects Common to All Action Alternatives section, except that the impacts are anticipated to be less than Alternatives 2 and 3 due to fewer acres being proposed for treatment and a reduced mileage of temporary road construction. However the acres that would not be treated under this alternative would retain the same degree of wildfire risk as under the Existing Conditions and No Action Alternative.

### **Cumulative Effects**

The cumulative effects for alternative 4 are the same as those identified in the Effects Common to All Action Alternatives section.

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**APPENDIX A: Forest Visitor Survey - Mount Elden / Dry Lake Hills Area**

The U.S. Forest Service is preparing to conduct a planning effort for recreational opportunities within the Mount Elden/Dry Lake Hills area. Friends of Northern Arizona Forests, a non-profit organization, and the NAU Forestry Club is assisting the Forest Service by conducting a forest visitor survey to better understand who currently uses the area, what type of recreational activities people enjoy in the area, as well as what forest visitors would like to see in the future. Your cooperation in completing this 5 to 10-minute survey would be greatly appreciated. One survey per forest-visitor please.

1. What is your zip code? \_\_\_\_\_
2. How often, on average, do you visit the Mount Elden/Dry Lake Hills area? (circle one response)  
Daily    Between 3 and 6 times a week    1 or 2 times a week    Once a week  
A couple of times a month    Once a month    A few times a year    First time
3. Please identify your age group. (circle one response)  
15 and under    16 to 25    26-35    36-45    46-55    56-65    66 or older
4. Were any children under the age of 15 with you on your forest visit? (circle your response)  
Yes    No
5. What is your gender? (circle your response)    Male    Female
6. What activities do you participate in when visiting the Mt. Elden/Dry Lake Hills area? (Please rate with 1 being most common)  
\_\_\_\_ Walking/Hiking    \_\_\_\_ Mtn. Biking    \_\_\_\_ Jogging/Running  
\_\_\_\_ Horseback Riding    \_\_\_\_ Rock Climbing    \_\_\_\_ Walking Dog  
\_\_\_\_ Wildlife Viewing    \_\_\_\_ Picnicking    \_\_\_\_ Hunting  
Other activity (please specify) \_\_\_\_\_
7. Generally, when do you visit the Mt. Elden/Dry Lake Hills area? (circle one response)  
Weekdays    Weekends    Both
8. How much time do you generally spend in the Dry Lake Hills/Mt. Elden area each visit? (circle one response)  
Less than 30 minutes    30 minutes to 1 hour    1 to 2 hours    2 to 4 hours  
More than 5 hours
9. Would you consider your primary use of the area to be for: (circle one response)  
Recreation    Health and Exercise    Commuting    Fitness Training (marathon, triathlon, etc.)

Other (please specify) \_\_\_\_\_

10. If you use the trails to commute, what is the total round trip mileage and which trail(s) do you use?

\_\_\_\_\_

11. How do you generally access the Mt. Elden/Dry Lake Hills area? (check one)

\_\_\_\_ Drive to a trailhead (if so, which trailhead(s) \_\_\_\_\_

\_\_\_\_ hike/walk from residence \_\_\_\_ ride bike from residence

\_\_\_\_ ride horse from residence

Other (please specify)

\_\_\_\_\_

12. Do you feel the current trail use, by the general public, on the Mt. Elden/Dry Lake Hills area is: (circle one)

Congested (too many people)    Adequate (not an issue for you)

Not crowded (not very many people)

Comments \_\_\_\_\_

13. Have you ever had a negative incident with another trail user on the Mt. Elden/Dry Lake Hills area? (circle one)

Yes    No    If yes, please comment on what occurred and where.

Comments \_\_\_\_\_

\_\_\_\_\_

14. There is a significant demand for organized trail events (i.e. marathons, mtn. bike races, etc.) on the Mt. Elden / Dry Lake Hills trail system. Do you feel these types of events are suitable activities for this area? (circle one)

Yes    No    Do not have an opinion

Comments \_\_\_\_\_

15. Do you feel the current use of the area for organized events (i.e. marathons, mtn. bike races) is:

not enough events    1    2    3    4    5    too many events

Comments \_\_\_\_\_

16. In your opinion, the condition of the trailheads for the Mt. Elden/Dry Lake Hills trail system are: (circle one)

Excellent    Good    Fair    Poor

17. In your opinion, the maintenance of the Mt. Elden/Dry Lake Hills trail system is:  
(circle one)

Excellent    Good    Fair    Poor

18. In your opinion, the trail signage for the Mt. Elden/Dry Lake Hills trail system is:  
(circle one)

Well signed (easy to know your location)  
Poorly signed (difficult to know your location)

19. Do you feel safe when using the trails within the Mt. Elden/Dry Lake Hills trail system? (circle one)

Yes    No    If no, please comment.

Comments \_\_\_\_\_  
\_\_\_\_\_

20. What services/amenities are important to you within the Mt. Elden/Dry Lake Hills area? (please rate by circling - with 1 being most important and 5 being least important)

Maintained Roads	1	2	3	4	5
Trailhead Parking	1	2	3	4	5
Informational Kiosk	1	2	3	4	5
Restrooms	1	2	3	4	5
Trash Receptacles	1	2	3	4	5
Maintained Trail System	1	2	3	4	5
Trail Signs	1	2	3	4	5
Picnic Tables	1	2	3	4	5
Other (Specify) _____	1	2	3	4	5

21. In your opinion, are there other (non-motorized) forms of recreation that should be provided within the Mt. Elden/Dry Lake Hills area that are not currently available?  
(circle one)

Yes    No    If yes, please provide the type of recreation and suggestion for a location:

\_\_\_\_\_  
\_\_\_\_\_

22. What services/amenities do you think should be provided within the Mt. Elden/Dry Lake Hills area, and where would you specifically suggest they be located? (ex: new trailhead at jct. of Schultz Pass rd. and Elden Lookout rd.)

Comment: \_\_\_\_\_  
\_\_\_\_\_

23. Would you be willing to pay an annual use fee to help maintain the Mt. Elden/Dry Lake Hills area? (circle one)

Yes    No    If yes, what do you believe is a reasonable amount for an annual fee:

\_\_\_\_\_

24. Would you be interested in volunteering to maintain the Mt. Elden/Dry Lake Hills area? (circle one)

Yes    No    If yes please provide contact information:\_\_\_\_\_

Additional comments:\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Thank you for participating in this survey. The information you provided will assist the Forest Service with the planning effort for Mt. Elden/Dry Lake Hills area which is scheduled to begin in January, 2012. If you have any questions or comments about this project, please feel free to contact Brian Poturalski, Recreation Staff Officer, at the Flagstaff Ranger District 928.526.0866.